Telephone Engineer

The International Technical Journal

Founded in 1909

Published Monthly by TELEPHONE ENGINEER PUBLISHING COMPANY.
A magazine devoted to the interests of the entire telephone industry
—operating men and manufacturers.

OFFICE OF PUBLICATION: MORTON, ILLINOIS — EDITORIAL OFFICE: 185 N. WABASH, CHICAGO, ILL.

VOLUME 37 — NOVEMBER, 1933 — NUMBER 11

CONTENTS OF THIS ISSUE

Editorials 9-10
- Telephones Must be Sold Today
- Advertising to the Public
- Why Not "Sell Now" Campaigns?
- Quality Needs No Defense

Bolstering Weak Points of Service . *T. DeWitt Talmage* 11-12-36

Progress in Common Battery Equipment . . *G. R. Eaton* 13-14

Rating Transmission Performance . . *W. H. Martin* 15-16-36

Boosting Revenue with Telegraph . . . . . *R. C. Reno* 17-26

Selling Discussed at Illinois Meeting 18-31

Line and Desk . . . . . *Ray Blain* 19-23

Ramblings . . . . . *J. A. Smith* 22

Bell Companies Report Station Gains 23

News from the Field 24

Why I Lost That Sale 28

News of Manufacturers 32-34

J. A. SMITH, *President and Treasurer* — C. L. JONES, *Vice-President*
R. C. RENO, *Vice-President and Editor* — F. A. BOWDLE, *Vice-President*
D. WEINER, *Secretary*
Eastern Representative
H. S. DURLAND, 63 Hinsdale Pl., Newark, N. J., Telephone BRanchbrook 3-2217

SUBSCRIPTIONS: U. S., CUBA, MEXICO, $2.00 PER YEAR; CANADA, $3.00; IN ALL OTHER COUNTRIES, $4.00. SINGLE COPIES, U. S. A., 20 CENTS.

ENTERED AS SECOND-CLASS MATTER, AT THE POST OFFICE AT MORTON, ILLINOIS, UNDER THE ACT OF MARCH 3, 1879.

Telegraphs

Telephone manufacturers have many problems in developing improved equipment with which telephone operating companies can produce the best in service for their subscribers. G. R. EATON in his article in this issue presents some of the problems met in developing the present efficient handset telephone. Mr. Eaton's explanations should furnish a basis for a selling argument for this type of instrument.

◆

Yours truly enters the picture, starting with this issue, in presenting a series of articles on revenue producing products that can be merchandised by telephone companies. Write us and let us furnish you further information about these products. We are sincerely interested in helping you increase your revenue.

◆

Returning after a few month leave of absence, RAY BLAIN, ed tor of *Telephone Engineer's* "Line and Desk" is not hesitant in slapping us on the back when he said: "Have just received the September issue of *Telephone Engineer* in its new dress and must say you have done a good job. Someone once said, 'Without change there can be no progress' and when one views the changes in *Telephone Engineer* progress cannot be denied." We're certainly glad to welcome back Ray because ever since he wrote his first "Line and Desk" copy our readers have been clamoring for more.

◆

Before you forget it, sit down and use the Special Christmas Subscription blank in this issue and send your friends a useful gift —*Telephone Engineer.*

R. C. R.

"When Peggy cries 'Hello, Daddy!'"

AN EASTERN salesman travels the territory within a hundred-mile radius of his home. He's often away a week. But every night he chats with his wife and little girl . . . by telephone. "It keeps us close together," he says. "I forget the day's trials when Peggy cries, 'Hello, Daddy!'"

* * *

Your telephone has many happy, human uses. When the family is scattered by business, school or vacation. When friends move to other cities. When there are babies, birthdays or anniversaries. Then a friendly, *personal* greeting means so much — and costs so little.

The day rate for station-to-station calls is about 25c for 25 miles, 50c for 75 miles, 75c for 125 miles. Many evening and night rates are lower. Where the charge is 50 cents or more, federal tax applies.

TELEPHONING OUT-OF-TOWN COSTS LITTLE

25 MILES 25c

75 MILES 50c

125 MILES 75c

THE rates above are for daytime station-to-station calls. Rates for other distances are similarly low. Evening and night rates are about 15% to 40% *less.*

How little the cost of a single call, compared to the pleasure it brings! It's the quickest way to keep in touch with those who are dear to you—the folks back home—a husband away on business—a boy at school or camp —friends in other cities who are having birthdays.

Some one would be happy to hear your voice today! Why not? You can find the rate in your own directory or ask for "Information."

RESIDENTIAL

Telephones **MUST** be **SOLD** Today

ALTHOUGH telephone companies conducting sales campaigns find them productive of real results, there are many companies that have not taken the time or trouble to work out campaigns.

Whether managers think sales campaigns are not dignified enough for telephone companies, or whether they think they take too much time or whether they consider them too costly, we don't know, but of one thing we are certain and that is the majority of campaigns have produced dividends far greater than the time and money invested in them. Most reports show that the cost of a campaign does not exceed the first month's revenue derived from the new business produced by the campaign and that the normal margin of profit is made on this new business the months thereafter.

Apparently the main reason telephone managers don't conduct campaigns is that they don't know just where to start in mapping out organized drives. There is no justification for this because for the past few years there have been offered many effective sales plans for all telephone companies, regardless of size. Today there are "ready-made" campaigns on the market, costs of which are very moderate.

And — there are the manufacturers — they are always ready to help any telephone company prepare a sales campaign. Just recently one manufacturer issued a "New Business Campaign" which gives in detail plans for the preparation and execution of a concentrated sales drive. The services of this manufacturer (or any other manufacturer) are available to operating companies.

We believe the reason that many telephone companies do not conduct campaigns is the fact that in the past it never has been necessary for them to "go out" after business — it came in over the counter. And it has been difficult for them — without fundamentals of modern selling — to adapt themselves to current sales and advertising practices.

The quicker telephone men realize that, in this day of mighty competition for the dollar, any product, whether it be a telephone or a washing machine, must be sold and the quicker they conduct sales campaigns the quicker their business will increase. The day of taking orders over the counter has passed and if telephones are to be sold they must be sold by the same methods by which other products are merchandised.

The National Association has provided a service which the industry has needed for years — a "central clearing house" to collect and distribute sales and advertising plans and ideas used by telephone companies throughout the country. Now that the Association has set up this "clearing house" it is the duty of every member company to support it by sending in details of any sales plans it has used and by requesting information on plans used by other companies.

R. C. Reno

EDITOR

The Telephone Business As We See It

Advertising to the Public Morse DellPlain of the Northern Indiana Public Service company, uttered some true words recently when he said the public utility should advertise in its local newspapers "to bring home to the consumer the fact that the utility is a part of the community and usually one of the largest taxpayers in it."

He states that the "advertising should emphasize particularly the service rendered and the desire of the utility company to meet truly the demands of the community, demands for the rounded additional services for which the customer pays in his monthly bill."

We agree with Mr. DellPlain because while there have been many complaints directed against telephone companies and their rates, the American public is essentially fair-minded, and if the facts are placed before it fairly, telephone companies, as they are operated today, should have nothing to fear.

▲ ▲ ▲

Why Not "Sell Now" Campaigns? No good purpose can be served by denying that many "Buy Now" campagins have failed. They have failed because they put the cart before the horse. People cannot be expected to rush out and buy something just because somebody tells them to do it. Spending is a reasoning process rather than a sentimental one. So it is here that selling comes into play.

Today it is your job and mine to see that we redouble our efforts to sell now. If we do a good job of "selling now" the "Buy Now" movement cannot possibly fail.

This is true in the telephone industry as in any other business. The public will not buy telephones just because the telephone manager or his employees say it should buy them. The telephone company must spend more money and time to sell their telephones or chances are they won't be sold.

This also goes for the telephone manufacturer. Manufacturers must show their faith in recovery by doing what consumers have been asked to do and spend as much money as possible for advertising and sales promotion to sell their products.

We all may have to spend on faith, but we stand to lose much more than we spend by not spending it. Every dollar spent to make others spend drives a nail in the coffin of Old Man Depression.

A "sell Now" campaign is a necessary adjunct to a "Buy Now" campaign.

▲ ▲ ▲

Quality Needs No Defense "It took three years of violent price appeal to make people forget quality. It may take equally long, with sound advertising and promotion, to bring quality back to its rightful place of supremacy. But it is being done," says P. A. O'Connell, president of the National Retail Dry Goods Association. This organization has been sponsoring the "National Quality Movement," which is beginning to secure results in the form of restored confidence and a more profitable basis for merchandising. Support has been given by merchants and manufacturers who are putting into practice the quality they are preaching, and are increasing their business by doing so.

Consumers are beginning to realize that low prices often mean shoddy goods and that they have paid dearly for their supposed bargains. After three years, the old surplus of quality goods has about vanished. The bargain days from distressed sales of surplus stocks of pre-depression make must be almost over. Not ony has the consumer been the loser in the cut-throat competition for sales volume, but workers', manufacturers' and distributors' earnings have been sacrificed.

Quality needs no defense. It means value to the user. It means repeat orders to merchant and manufacturer.

Telephone companies receive direct benefit from a movement of this kind. The sales of quality merchandise means a greater working profit, greater activity and greater purchasing power of manufacturers and local dealers and increased wages for workers, which are essentials for a prosperous market for telephones and other communication products.

These same principles should be considered when purchases of telephone equipment are made.

▲ ▲ ▲

Learn to say what you have in mind. Don't hesitate or talk in an undertone; it only confuses your prospect. Once a prospect is confused, you might just as well consider the sale lost.

▲ ▲ ▲

"Little streams make big rivers." If you make two sales this week and each of your fellow employees makes two sales, the combined results will mean big things for your company.

BOLSTERING WEAK POINTS OF SERVICE

Purchasing Public More Discriminating in Telephone Service Requirements — Operator's Answering Time — Advantages of "Floated" Storage Batteries — Making Improvements on Points Most Rapidly Noticed by Patrons.

By

T. DeWITT TALMAGE

TELEPHONE companies are in much the same predicament that their subscribers are in, namely, they have fewer dollars to spend than formerly. In order to stretch the purchasing power of the dollar, the public is doing some unprecedented planning in advance of making its expenditures. As a result people have become more discriminating about what they purchase.

These more exacting demands of a shrewder buying public have spread out to include service purchased with the telephone dollar. The necessity for meeting these demands has spurred some telephone managements to action at a time when they were least able to finance improvements in their service. Consequently, types of improvements which have been made under these conditions have been carefully studied and weighed in their relationship to the cost involved and the ultimate effectiveness of the betterment.

Must Raise Standard

Serious as this demand for better telephone service is in some localities, it is not without its beneficial aspect because service improvements are being hastened in some areas which have not heretofore been fully responsive to the trend toward a higher grade of telephone service. In these areas it is not enough to maintain service at the same level, but it is necessary to raise the standard of service so that the community will think more of the service and its value than they do of its price.

In general, the grade of telephone service required by a community varies with telephone development of that area. In particular localities special needs may have to be considered for the determination of the grade of service to be rendered. In all cases, however, general satisfaction of the majority of users is the most important criterion of good service.

Some small exchanges are being operated efficiently because the necessary incentive is present in one form or another. But many other exchanges, while they have sufficient incentive for economy because of law revenue, lack an incentive for good service. A number of like sized exchanges are grossly mismanaged because of certain existing conditions, or by a blessed ignorance of the basic principles of economy, and a true perspective of what constitutes satisfactory telephone service.

Illinois Has Law

In the state of Illinois the Illinois Commerce Commission Act requires that every utility shall furnish adequate and efficient service to all customers, subscribers, and users of such service, and invests in the commission the authority to formulate from time to time such standards and definitions of adequate and efficient service as it may deem just and necessary.

The Illinois Commerce Commission formulated just such requirements. The commission believed that its original establishment of standards for telephone service had been of such material aid in bettering service throughout the state that it issued a revised set of rules to meet changing conditions. The rules promulgated in this order, known as General Order No. 107, were the result of careful consideration and subsequent investigation with reference thereto. The purpose of the rules was to prescribe a grade of telephone service which would be reasonably adequate for the public, and which at the same time could be furnished economically by the telephone company.

Service inspections and surveys, if conducted upon the basis of determining simply whether or not an exchange is rendering service according to some predetermined standards or requirements, give no comparative value whereby service rendered in one community can be compared to that in another. To overcome this condition, a system of grading could readily be utilized depending upon the actual conditions found as well as records kept by the exchange.

Need For Service

There is a distinct need for such a system of rating service in order that we may accurately appraise and compare service rendered to subscribers in various areas. The necessity for such a system arises out of the fact that at the present time it is difficult, practically impossible, to state specifically how telephone service in one town compares with that in a similar town, or how one state compares with a similar state, although there appears to be a need for such activity due to increased demand for better service in some sections of the country.

One of the important factors which enters into the furnishing of good telephone service is the speed with which the operator answers the subscriber's call. This is covered in Rule 8 of the Illinois Commerce Commission's general order No. 107 as follows:

"Any telephone exchange serving more than five hundred city subscribers shall be considered giving reasonably prompt service if ninety-five (95%) per cent of all calls are answered in ten seconds or less. All other telephone exchanges shall answer at least ninety (90%) per cent of the calls within ten seconds or less, except where the traffic is insufficient to require the entire attention of an operator and the exchange is operated in connection with other work, slower service may be adequate . . . ."

Strongest Argument

However, the public receives its general impression of the quality of telephone service in many ways in addition to a prompt "Number, please?" One of these ways is the ease with which they hear the operator. If the subscriber has difficulty in hearing the operator he becomes annoyed or irritated. Therefore, since the judgment of the character of the service is influenced by how well patrons hear the operator's voice, it is essential that the talking qualities of the operator's transmitter be periodically tested for satisfactoriness.

The telephone company with limited funds to spend on improvements might well follow the advice that the experienced trial lawyer gave to his new assistant: "Make your strongest argument on the points your jury knows

best and will see quickest."

Because the operator's telephone set enters into the quality of every call, it presents one of the most advantageous points upon which to concentrate efforts aimed at increasing attractiveness of telephone service.

Current Problem

One of the weak points of service in many magneto offices is the lack of uniformity of volume output of the operator's transmitter. For that reason it behooves us to consider the use of a more constant and efficient supply of current for such transmitters. The use of dry cells is not entirely satisfactory due to the fact that only for a short period of time, while cells are new, is the volume of transmission at its maximum value. A more desirable method is the use of primary cells for storage batteries for the operator's transmitter as well as for the night alarm circuit.

One of the newest developments in primary batteries for operator's transmitters is the "air cell" battery which consists of two air-depolarized, constant-voltage cells connected in series. This unit has a life of about 6,000 talking hours if the drain does not exceed 100 milliamperes. This battery is shipped dry and it is activated for service merely by filling with ordinary drinking water. The voltage of the T-600 unit is never above five nor below four volts.

The tendency today is to charge storage batteries by the trickle charge method, or by the automatic control method. The trickle charge method, also called float method, consists of a storage battery continuously connected to the load and the power source and the voltage held within a narrow range at a point which normally maintains the battery in a practically fully charged condition. The current output of the rectifier is the sum of the very low current, generally termed trickle rate,

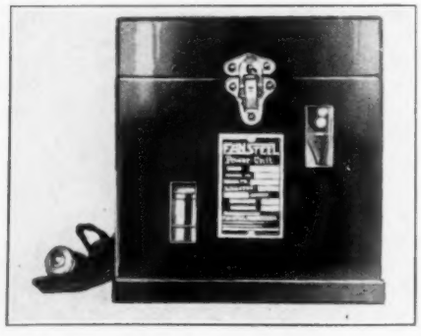


Fig. 1. Front View of Combination Storage Battery and Rectifier Unit with Built-In Pilot Ball Charge Indicator. This Unit is Used to Supply Current to the Operator's Transmitter in Magneto Central Offices.

The Largest Room in the World is the Room for Improvement

required to counteract the small battery losses plus the average load on the system.

Saving Possible

The automatic control method allows charging equipment to automatically operate when the battery discharge reaches a predetermined point. The charger automatically disconnects when the battery becomes fully charged. Automatic control of charging equipment eliminates overcharging with a consequent saving. The control unit may be either an ampere-hour meter or a voltmeter relay. Many companies prefer an ampere-hour meter because the operator can tell at a glance the number of ampere hours of reserve battery current available. The operation of the voltmeter is controlled by the high and low voltage of the battery.

The advantages of the floating battery system over the cycled system are: (1) A more uniform voltage is maintained on the apparatus; (2) Acid fumes are absent; (3) Less frequent addition of water (in a properly floated closed glass jar battery it is necessary to add distilled water only three or four times yearly; (4) More reserve capacity is available, as the battery is kept in a fuller state of charge at all times; (5) Less routine maintenance, as once the floating rate is adjusted for traffic conditions it requires very little attention; (6) Floated batteries deposit very little sediment during their entire life which never requires their removal; (7) The life of a storage battery is longer.

All trickle chargers for telephone service usage are designed to eliminate any ripple or hum in the charging current so as to assure perfectly quiet operation of the telephone circuits.

Equipment Available

For the smaller magneto offices there is available a self-contained operator's power supply unit consisting of a trickle charger and a sealed type 4-volt storage battery which operates from 110-volt, 60-cycle A. C. current. This power unit is large enough to furnish current for two or three operator's transmitters. It has sufficient battery reserve for approximately four days, should the commercial current fail. The only attention required by this convenient unit is the addition of distilled water to the battery and rectifying cell once every three of four months.

The outstanding feature of such a unit is that it assured a continuous, uniform current to the operator's transmitter which results in a constant, satisfactory level of transmission to the customers. It also affords relief from the inconvenience and cost of frequently renewing dry cells.

The points emphasized in this discussion are only a few of the many practices which have been found essential in the make-up of good telephone service. The entire group of fundamental components of telephone operation is a rather lengthy but exceeding interesting list of requirements. It will be appreciated that any one of these fundamentals is worthy of a complete discussion in itself, but available space does not permit detailed descriptions of the niceties of design and engineering involved.

Satisfaction Big Goal

We must recognize, of course, the fact that the public will not analyze these features upon a technical basis as we have done here, but cumulatively these features will produce in the mind of the subscriber the thought of satisfaction of service, and that is what we are working for. The subscriber is the one who supports the telephone industry, and it is this same subscriber, therefore, who must be counseled as to whether the endeavors of those operating in the industry are being appreciated by the customer.

I do not mean, of course, any special customer. I mean *the* customer taken as a group, the "Man with the Telephone Dollar" who lives everywhere, and who, although he may know nothing about the technicalities of the telephone business, is the only person whose wishes are worth considering.

(*Please turn to page* 36)

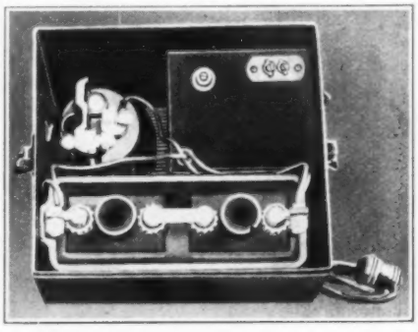


Fig. 2. Inside View of Power Unit Consisting of a Rectifier, Transformer, Rheostat, and a 4, 6, or 8 Volt Storage Battery Assembled in a Compact Steel Cabinet. Charge Indicators and Electrolyte Levels are Visible from the Front without Removing the Cover.

TREND IN COMMON BATTERY EQUIPMENT

By
G. R. EATON
Chief Engineer
Kellogg Switchboard & Supply Co.

THE past twenty years have shown little change in the subscriber's common battery telephone instrument until the hand set went into general use.

Telephone instruments of this type had been manufactured for a number of years in this country and were used by some telephone companies. The subscriber's demand was likely brought about by the showing of these sets in motion pictures.

The standard telephone circuit used for many years was the "side-tone" or "booster circuit." Transmitting and receiving efficiency of the induction coil used in this circuit had been improved over the years until it was with less than one deci-bell of ideal.

The "anti-side-tone" circuit had been used on operator's sets for many years. Some use had been made of the circuit in subscriber's instruments, but the overall efficiency had not been up to the standard of the older type circuit.

The general use of the hand set brought out the fact that with the transmitter closely coupled to the user's mouth the side tone was objectionable under certain conditions. This occurred on subscribers who were in the habit of standing some distance from the mouthpiece on the desk stand or wall set and talking in a rather loud voice. Another instance was where one of the telephones used by the subscriber was down in transmission, which made it necessary for the subscriber to talk loud over this telephone.

This condition brought about the development of commercial circuits of the side tone reducing type. In the design of a circuit of this type, if the side-tone was reduced to zero, subscribers would think the telephone was not talking and would raise their voice to an objectionable level. This is especially true where they may be using both the new and the old telephone. The amount of side tone reduction should be high on a zero loop as this is the condition where side tone is the most objectionable.

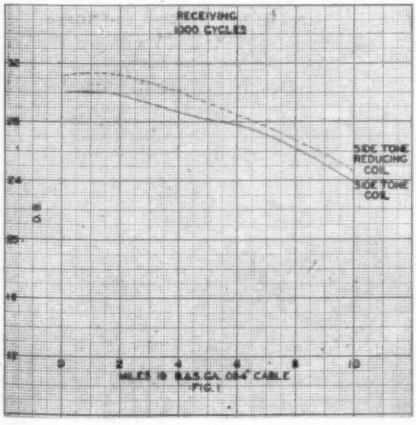


FIG. 1

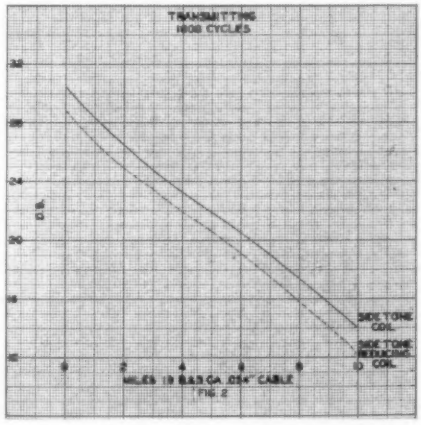


FIG. 2

The receiving efficiency is shown in Figure No. 1 for various lengths of No. 19 B. S. ga. loops and measured at 1000 cycles. The side tone coil is the standard common battery coil and the side tone reducing coil is the new coil. This comparison shows the new circuit one-half D. B. better than the older circuit. The new circuit is more quiet on reception in noisy locations, which further improves reception under certain conditions.

The transmitting efficiency is shown in Figure No. 2 as compared with the regular side tone coil. The new coil is the side tone reducing coil. The transmission is one and one-half D. B. below the older circuit, but due to the reduction in voice current through the receiver the subscriber will talk louder without additional effort into the transmitter of the new circuit and there will be a gain in outgoing transmission of from two to three D. B.

Figure No. 3 is a comparison of the voice current in the user's ear on out-

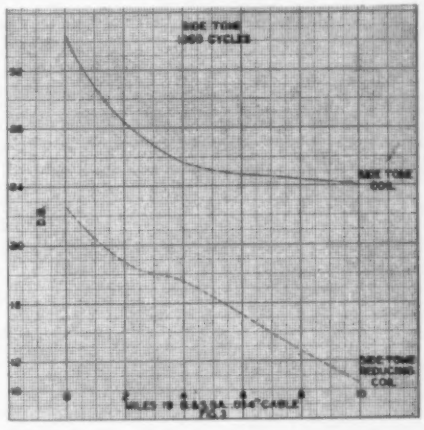


FIG. 3

going transmission. This shows the voice currents in the subscriber's ear when he is talking is 11.5 D. B. below the old coil at 1000 cycles and a zero loop and is uniform on varying lengths of loops; i. e., the subscriber when talking receives less than 10 per cent of the power of his own voice in his ear to that received over the older circuit.

The curves in Figures Nos. 1, 2 and 3 show a design with balanced in and out transmission for the new circuit, and a circuit which in use will give a major improvement in both the receiving efficiency and the transmitting efficiency.

Figure No. 4 shows the circuit which functions as follows:

TRANSMITTING—The battery supply to the transmitter flows over L-1 through terminals 2-1 of the induction coil through the transmitter and back over line L-2. The voice frequencies generated in the transmitter can momentarily be considered to flow from the transmitter through the induction coil winding 1-2 through the line and back to the transmitter. There is also a circuit for the voice frequencies through coil winding 5-6, condenser C_1 to the transmitter. The voltage induced from winding 5-6 of the coil into winding 1-2 adds to the current through 1-2 to strengthen the transmitting current. The voltage induced from 5-6 to 3-4 is the reverse to that induced from 1-2 to 3 and 4

which tends to neutralize the current in the coil winding 3-4 to which is connected the receiver.

RECEIVING: On receiving the current can be considered as momentarily flowing over L_1 through winding 2-1 and through the transmitter to L-2. This induces a voltage in winding 3-4 across which the receiver is connected. Current will also flow through winding 5-6 and condenser C_1. The voltage induced by this winding will strengthen the current in 3-4 induced from windings 2-1. Condenser C_2 is in series with the receiver and the capacity reactance balances the inductive reactance of the receiver at 1000 cycles. The lower contact on the switchhook shown at X maintains a shunt on the receiver so that on harmonic ringing there will be no ringing induction in the receiver when the receiver is on the switchhook.

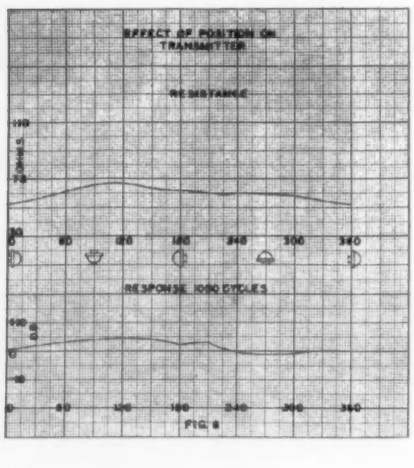
Non-Positional Transmitter

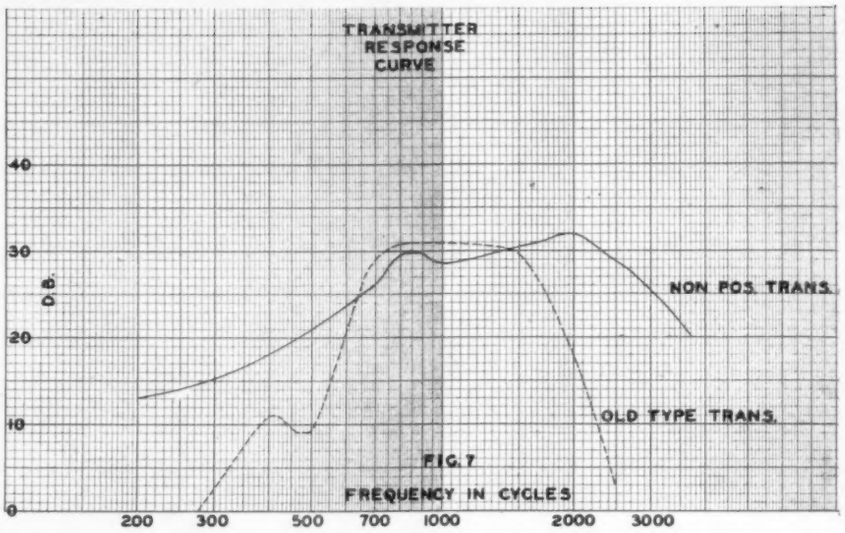
The non-positional transmitter has been in design for the past three years.

The objects of the design were for a transmitter having uniform response

without regard to the position in which it was held; better articulation, i.e., a more uniform frequency response covering a wider frequency band; elimination of the packing tendency of the older types; and better uniformity in production.

The non-positional feature was secured by spherical front and back electrodes. This gives uniform action regardless of position and removes the tendency to pack found in the flat electrode type.



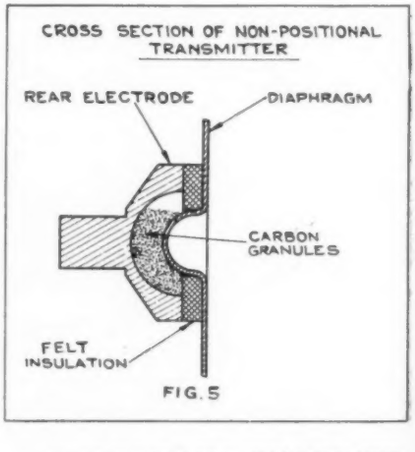


The transmitter has an .005 phosphor bronze diaphragm ribbed to provide stiffness with a low mass. The front electrode is formed as part of the diaphragm and is spherical in shape and gold plated. The carbon chamber is spherical in shape and gold plated. The transmitter is sealed around the diaphragm and the back electrode to prevent moisture entering the carbon chamber. With this type of construction, see Figure No. 5, an excess carbon fill is unnecessary as there is no position in which the transmitter can be held so that the carbon will fall away from the electrode. Figure No. 6 shows the effect of position on response and also as to the resistance. This curve shows that the maximum loss in response is only one D. B. in any position when measured in its normal or vertical position, i.e. there is no position in which there is a serious loss in transmission or noticeable frequency distortion.

In the older type transmitters the high frequency response was low and this was attenuated when the telephone was connected to a line containing cable. The losses on a circuit containing cable increases as the frequency increases. A marked improvement has been made in the quality of reproduction by improvements to care for this condition. In considering the range of frequencies it was common to consider all frequencies within 20 D. B. of the maximum response. Figure No. 7 shows the curves of the older type transmitter and also the non-positional transmitter. Twenty D.B. down on the older type would be 500 cycles per second to 2300 c.p.s. On the non-positional type of 10 D.B. down would cover frequencies from 500 c.p.s. to 3500 c.p.s. with a corresponding increase in quality or articulation. Ten D.B. down on the older type would give an articulation of 70 per cent. Ten D.B. down on the non-positional type gives an articulation of 85 per cent, which is readily distinguishable to the average ear.

A large part of the telephone circuits over which the transmitter will be used are cable having a greater loss at the higher frequencies than at the low. In order that better quality might be maintained under average conditions the transmitter has a slightly rising characteristic.

The new type transmitter is slightly lower in response when measured at 1000 c.p.s. but the overall response on voice frequencies is 5 D.B. above the older type; i.e. the transmitter will give commercial transmission over a 5 D.B. longer line than the older type with the peak frequency response no higher than the older type and with no danger of too much transmission on a zero loop.



RATING TRANSMISSION PERFORMANCE

By
W. H. MARTIN

It has been requested by a telephone operating man that TELEPHONE ENGINEER publish a series of articles giving information on rating the transmission performance of telephone circuits.

With the cooperation of the American Telephone and Telegraph company an interesting series of articles on transmission basis for plant design has been developed, this article being the first of the series.

While these articles discuss rating of transmission performance on the basis set up for the Bell System, we are sure they will prove interesting and valuable to Independent telephone men.

A METHOD of rating the transmission performance of telephone circuits is of course an essential in specifying the grades of transmission service to be furnished, in designing, constructing and maintaining telephone systems to provide the desired grades of service economically and in the development of the various elements of the telephone system which affect its transmission.

As the art of telephone transmission has developed and greater refinements have become possible and desirable, changes have naturally been made in the methods of specifying and rating transmission performance. Since many such changes have been made in recent years, it seems opportune to discuss the rating of transmission performance and to set forth the rating method which is now being adopted in the Bell System for determining and expressing the data for the transmission design of the plant. In this connection, various methods which have been employed for measuring the transmission performance of telephone circuits will be discussed to indicate their application and also their relation to the new rating method.

Qualitative Standpoint

It is the purpose here to discuss this rating matter primarily from the qualitative standpoint rather than to present in quantitative detail the various relations involved in rating telephone transmission. Obviously, the determination of many of these relations presents sufficient material for separate treatment.

In carrying on a telephone conversation three major functionings are involved, namely, that of the talker in formulating his ideas and uttering words to convey these ideas, that of the telephone circuit in taking the sounds of these words and reproducing them at another point, and, lastly, that of the listener in hearing and recognizing these reproduced sounds and in comprehending the ideas which they are intended to convey.

It is evident that all three of these functionings affect the success of the telephone conversation. Since, however, the functionings of the talker and listener are common to both direct and telephone conversations it might seem that the consideration of the transmission performance of a telephone circuit could be limited to the functioning of the circuit itself. In line with this, there has been some tendency to confine such considerations to relations between the sounds reproduced by the telephone circuit and the sounds impressed upon it. The performances of the talker and listener, however, are materially affected in certain important respects by the telephone circuit, and determinations of the relative merits of the transmission performances of different telephone circuits, must therefore go farther than the performances of the circuits themselves and take account of the combined action of the talker, circuit and listener.

Characteristics of Conversation

In view of this reaction of the telephone circuit on the talker and listener, attention is directed to the pertinent characteristics of their performances in both face-to-face and telephone conversations.

In direct or face-to-face conversations both the talker and listener more or less subconsciously adjust their actions in many respects to each other and to their circumstances. The loudness of talking is placed initially at a level which experience has shown to be suitable for the conditions and for the particular listener. If the listener indicates verbally or by his expression that he is understanding easily or with difficulty, some further adjustment may be made in the loudness of talking. Since the talker judges his own talking level largely by the loudness with which he hears his own voice, this level will be a function of the amount of reverberation in the place in which he is talking. Apparently for a wide variation of loudness in the customary talking range, the speaker is not in general conscious of the amount of energy which he is expending. Noise at the place of conversation also plays a part in determining the talking levels since it makes louder talking necessary in order to permit a given degree of understanding on the part of the listener.

Enunciation Discussed

Along with an adjustment in talking level, the talker may improve his enunciation if difficulty of understanding is expected or indicated by the listener. There may also be a change in the manner of expressing the ideas in avoiding words which experience has shown are difficult to understand and an idea may be stated in more than one way in order to insure its comprehension. Other adjustments on the part of the talker may be determined by his opinion of the mental acuity of the listener, by the familiarity of the listener with the matter under discussion and by the interest in it. These factors affect the way of expressing an idea, the kind and number of words used and hence the time taken.

The listener also adjusts himself to the conditions by an amount which is determined somewhat by his interest in the matter under discussion. He may strive to comprehend the transmitted ideas and require few repetitions by the speaker or he may refrain from exerting himself and so tend to evoke greater effort on the part of the talker. At times he may pretend not to understand in order to get confirmation of a statement or to gain time in replying to a question.

In view of these factors and of the normal variations of different talkers and listeners in all these respects, the portion of the questions and statements of conversation which is correctly understood and the time required to interchange certain ideas may vary widely for different conversations even when they are carried on under a fixed set of local conditions. If it were desired to determine a measure of the conversational satisfactoriness of these conditions, in addition to some quantitative method for rating each conversation, there would be required, therefore, observations on a large number of conversations between different people in order to take account of the variables due to the material of conversation, the people, and their abilities and desires to accommodate themselves to the conditions.

In telephone conversations, there are adjustments between talker and listener as in the case in direct conversations, but there are certain definite differences in this regard because of the interposition of the telephone circuit between the participants. Here also, the speaker tends to adjust his talking level to the loudness with which he hears his own voice. In this case, however, he hears his own voice not only through the air path, but also through the "sidetone" of the telephone set, that is, through the electrical path from his own transmitter to his own receiver. When this electrical path is more efficient than the acoustic path, the sidetone will tend to control the talking level. It has been found that varying the sidetone of the set has on the average a definite effect on the talking volume of the speaker, the talking volume being lowered as the efficiency of the sidetone path becomes greater.

Adjust Volume

In a telephone conversation, there is also a tendency for a person in talking to adjust his volume on the basis of the loudness with which he hears the person at the other end of the circuit. If the voice of the other person comes through weakly, he judges that the connection requires loud talking and acts accordingly. If the listener indicates that he is not understanding, the talker may talk more loudly or closer to his transmitter, and also make such adjustments in enunciation. Also, the loudness of talking may be affected by the room noise at the location of the speaker, which noise incidentally may not reach the listener and so play no part in his reception.

Aside from cases where the room noise at the far end is severe enough to be heard over the telephone circuit, the speaker does not have definite knowledge of the room noise at the listener's end and therefore is not in a position to adjust his manner of talking to this condition except in so far as the listener may indicate difficulty in understanding.

In listening, the result is of course dependent upon the position of the receiver with respect to the ear. The local room noise reaches the ear to which the receiver is held both by the path between the ear cap of the receiver and the ear, and also through the sidetone path of his telephone set. Some telephone users have learned that this effect may be reduced by holding the receiver tighty to the ear and by covering the mouthpiece of the transmitter when they are listening.

Depends on Users

It is evident that the success of telephone conversations depends not only upon the performance of the telephone but also upon the performance of its users, the material of their conversations, the way in which they talk into the transmitters and hold the receivers to their ears and the room noise conditions. In addition, it is seen that the performance of the telephone affects the performances of the users in such important respects as the loudness of talking, the manner of presenting the ideas and the amount of effort exerted to understand. Also, the effect of the room noise is a function of the circuit characteristics. Furthermore, the reactions of the circuit performance on those of the users are not constant but may vary from person to person and from conversation to conversation. In view of the random nature of these factors, which are beyond the control of those who design and operate the telephone system, the service performance rating of a telephone circuit should be on a basis which takes adequate account of their ranges and combinations in practice. This points to a rating based on a statistical analysis of results obtained under service conditions.

To determine and specify these factors so that it may be known how to duplicate the range of service conditions in laboratory investigations would be a prodigious task. Moreover, the duplication of these conditions under control is bound to introduce a large element of artificiality which would vitiate the results or at least raise serious questions as to their dependability.

Sufficient Data Needed

The practical solution is to get sufficient data regarding the results obtained over telephone circuits of different performance characteristics by their normal users in carrying on regular conversations. This requires a suitable quantitative method of rating conversations and observations on a sufficient number of conversations over each circuit condition to be investigated to constitute a reliable sample. This does not mean necessarily that all the practicable cricuit conditions have to be observed in this manner but rather that sufficient data be so obtained for the establishment of correlations with performance measurements which are susceptible to laboratory determination. The fundamental point is that service performance ratings need to be based on service results in order to take proper account of all the factors involved.

The distinction has been made between two kinds of transmission performance of a telephone circuit, namely, that indicated by relations between output and input sounds and that indicated by the results obtained by the users of the telephone in carrying on their conversations under service conditions. Performance indications of the first kind will be referred to as "transmission characteristics" of the circuit. The second kind of performance may be termed "transmission service performance." The distinction between these two kinds of performance is an important one and should be kept clearly in mind.

Output Sounds

The output sound dealt with in transmission characteristics are not only the reproduced sounds which correspond to

(*Please turn to page 36*)

A REAL TREAT

"It is a real treat when during the routine of business something comes into your hands which gives you a thrill that makes you 'Stop, Look and Read.' This is exactly what the September issue of TELEPHONE ENGINEER, *in its new dress, did to me.*

"Your rebuilding of TELEPHONE ENGINEER, *no doubt, has been a hard job, but it has been well done.*

"Let me compliment you. Also permit my expressing the hope that TELEPHONE ENGINEER *will prosper even more than it has done in the past, which is no more than it should do with the added attractiveness which you have given it not only in appearance, but in editorial comment.*

"I feel sure that TELEPHONE ENGINEER *with the many improvements made to it through recent months is far more valuable both to readers and to advertisers."*

W. T. EASTWOOD,
Advertising Manager,
Stromberg-Carlson Telephone Manufacturing Company

BOOSTING REVENUE WITH TELEGRAPH

By
R. C. RENO
Editor

IN SEARCHING for means of developing additional revenue, preference of the telephone company should be given to those additional services or by-products of existing telephone service which will produce the most net revenue with the least additional investment, but consideration should also be given to strengthening the position of the telephone company, as the communication center of its community.

Up to recently, Independent telephone companies have, in general been willing to restrict their role in their communities to that of simple purveyors of telephone service, leaving to others all other forms of communication, even those in which the telephone plays a vital part or to which the telephone plant is adapted with minor and inexpensive changes. Under present conditions, it is in many cases, doubtful if existing incomes of telephone companies will continue to give satisfactory return on the necessary investment, unless they are supplemented by a revenue from other possible uses of the telphone plant or organization.

In this country because of the demand for very rapid service between great cities with varieties of specialized services adopted to particular needs of different lines of business, telegraph has been necessarily developed as a highly specialized industry with a separate organization and wire plant. To extend telegraph communication, however, to the smaller communities where need of specailized high pressured services do not exist and where volume of telegraph business would not support separate organizations and wire plants, it is necessary to have recourse to the use of plant and other resources of industries to act as agents for telegraph companies.

The leading industry taking advantage of the revenue derived from telegraph messages was the railroad industry. At the time of the development of telegraph companies, railroads possessed the only wire plants that covered the country. Telegraph service in this way became necessarily, at that time, a by-product of the transportation industry.

In recent years, however, the whole country has been covered by a nation-wide network of telephone lines, much more extensive than those of railroads, and recently rapid progress has been made in developing the use of this vast telephone system and particularly the exchange networks, for the collection and distribution of telegrams. Rightly so, because, telegraph service is a by-product of the telephone company, and is a part of their business. They have wire connections to every business house and to most homes in their communities, and give a service throughout the 24 hours of the day, seven days a week. They are the natural communication centers of their communities and their employees are trained in just one thing—communication—and have no duties of a different nature to divert them.

Three Forms

This development has taken three forms, the relative advantages of which, from the telephone manager's standpoint, should be carefully considered.

First is the leasing of telegraph circuits superimposed on telephone circuits. This is only occasionally possible in Independent areas, as the presence of a user having sufficient telegraph business to justify the lease of a circuit is not a frequent occurrence.

Secondly, there has been a marked increase in the use of telephones for collection or delivery of telegrams by telegraph companies from which they receive telephone tolls at published rates and in some instances, a small fee for billing and collecting telegrams on telephone bills. This develops into a small additional revenue to the telephone companies, but has no benefit on their public relations nor the prestige in their community, as the sender of the telegram remains a customer not of the telephone company but of the telegraph company.

Third Plan Best

The third plan, and that which has made the most rapid progress, is that put forward by the telegraph company, according to which the Independent telephone company actually operates the telegraph service as agent for the telegraph company, collecting and distributing messages which are exchanged with the nearest telegraph office of the company named, receiving commission based on the amount of tolls on "outgoing paid" and "incoming collect" messages. Experience shows that two originating telegrams per year from each telephone result in a net revenue to the telephone company of approximately 50 cents per year per telephone.

By coordinating telegraph service with telephone service, the Independent company not only derives a much greater revenue, but takes its place firmly astride both major branches of the communication business, offering its patrons both written message and verbal communication service.

When the linking of these two services was first proposed, questions arose in the minds of many Independent tele-

(*Please turn to page* 26)

TELEPHONE ENGINEER considers it a duty to bend its efforts to give telephone men information and data regarding ways and means of increasing their companies' income. In recognition of this responsibility a series of seven or eight articles will be published in which will be described revenue producing products and services dealing with communication and which telephone companies can merchandise in conjunction with telephone service.

We recognize the fact that today telephone companies must give due consideration to methods which give them opportunities to increase their revenues and we will gladly furnish further information regarding the products described in this series of articles and will direct them to sources of supply.

1st Article Of a Series On Revenue Producing Products

SELLING DISCUSSED AT ILLINOIS MEETING

THE 29th annual convention of the Illinois Telephone Association was held October 25 and 26 at Hotel Abraham Lincoln, Springfield.

The first session of the convention was called to order at 10 a. m. Wednesday by Dr. J. G. Schwarz, president of the Association, and secretary-treasurer, Jerseyville Telephone company, Jerseyville. Following invocation by the Rev. Jerry Wallace, rector, Christ's Episcopal Church, Springfield, Mayor John W. Kapp, Jr., gave the address of welcome. Louis Pitcher, general manager of the Dixon Home Telephone company, responded to Mayor Kapp's welcome.

Dr. Schwarz then gave his annual address, discussing the National government's activities, taxes and general problems of the industry. He stated:

"For the first time in telephone history we are going along experiencing the same pains we find in other business enterprises, for we have discovered that we are not depression-proof. . . .

"Utilities are today suffering from business malnutrition, caused in a great degree by the effects of malediction, sponsored by the evil, which, according for Dr. David Friday, has been the cause of the continued business inclemency for the past three years, namely, political.

"It is possible that someone can offer a panacea for this condition, or that by concerted action by our own particular group we can so impress the public that we are supplying a necessity as well as a convenience; that it is an asset and not a liability, a saving and not an expense; that our service cannot be supplanted with anything which will be as satisfactory, with so small a cost; that you cannot have direct delivery of your voice to a loved one miles away, by any other means; and lastly, that it is a form of insurance which has been for the most part entirely overlooked in the service we render."

Ben B. Boyton, general counsel for the association, presented his report in which he related to legislation and its effects on the industry.

Secretary-treasurer A. J. Parsons then reported that the Association has continued to look after the welfare of its members and stated that there was a gain in membership and that the Association was in good financial condition.

During the year two members were dropped and three associate members resigned. Six new members were obtained as follows: Okaw Mutual Telephone company, Okawville; Tampico Farmers Mutual Telephone company, Tampico; Farmers & Merchants Telephone company of Moultrie County, Lovington; Farina Telephone company, Farina; Millersburg Switchboard company, Millersburg, and Sciota Switchboard company, Sciota.

The morning session adjourned following the selection of the nominating committee, which was composed of George X. Cannon, Freeport, chairman; L. F. Shepherd, Springfield; E. A. Purcell, Mattoon; J. H. Deal, Jacksonville; E. R. Cogswell, Chicago; E. D. Glandon, Pittsfield; Earl Stice, Altamont; Louis Pitcher, Dixon, and C. A. Altenbern, Savanna.

Dr. David Friday, who was to have been the first speaker Wednesday afternoon, was unable to be present, and in his place Dr. Ivan Wright, University of Illinois, gave the opening address. His subject was "Present Business Conditions and the Outlook for Prosperity." He said:

"The best way to get out of the depression is to turn back to those things which have worked in the past 2,000 years. If you don't know that a thing will work, find out how it has worked before."

He declared that we cannot change the value of an ounce of gold; that we merely change the contract between gold and paper. Changing the value of the dollar is only a way of inflation. That reduces the buying power of the creditor class, and the burden is higher on property owners through taxes.

Dr. Wright thinks the remedy is, First, understand what are sound economic rules affecting business; second, demand of the legislature that these sound fuudamental rules be followed. Educate them to it.

"The functioning of government is to maintain a high standard of citizenship and protect the people and not tell them how to run their business."

F. B. MacKinnon, president, United States Independent Telephone Association, was the next speaker, and discussed "NRA as Applying to Telephone Companies." Mr. MacKinnon explained the various phases of NRA and outlined the procedure followed in the filing approving of codes.

He pointed out that many companies with a large loss of stations are unable to increase payrolls and shorten hours. Some companies have increased the number of employees and cannot keep their properties up. Mr. MacKinnon warned that the properties should be kept up and maintenance not cut down to the damaging point.

In discussing "Present Plant Problems" O. R. Roach, general manager, Wabash Telephone company, Bloomington, stated that present plant problems are the same as they have always been, in that the two requirements which must absolutely be met today as any other time, namely, to furnish continuous service to subscribers and maintain plants so they do not present public hazards.

Mr. Roach urged his listeners to check the performances of their plant forces to see that their men do their respective jobs without actually wasting time.

The Thursday morning session was given over to discussion of telephone selling and allied subjects.

The first speaker was S. R. Edwards, who discussed the value of advertising and publicity to telephone operating companies.

In the absence of E. C. Blomeyer, president, Telephone Bond & Share company, Frank E. Bohn, president, Home Telephone and Telegraph company, Fort Wayne, Ind., presented his paper on "What Next?" The keynote of Mr. Blomeyer's paper was that "the telephone business has apparently passed the bottom and is headed up again with two routes before it: One is to settle back into old ways and routines, and be content with what the future may bring. The other is to use the lessons the depression has taught us and make the business not only bigger but also better than ever before."

The job ahead of us, Mr. Blomeyer believes, is to vastly extend the telephone's use, and we need have no fear of saturation, providing a way can be found to supply the kind of service the people can use at prices they can reasonably afford to pay.

O. P. T. Daenitz, sales engineer, Associated Telephone Utilities company, then discussed "Ways to Recover Lost Subscribers." He said:

"Telephone service succeeds only as the service is accepted by the community. That means everything — public relations, newspaper advertising, collections, selling.

"The companies must be sold to the newspapers and advertisements worded to fit the subscriber. The advertisements must make the reader want to read them.

"If by any means you can improve outside plant, that is another step in selling. Selling is not begging a person to take a telephone."

Mr. Daenitz then gave steps in preparation for selling a prospect. There are some 40 or 50 questions to be answered, starting with: Do we have facilities to serve him? Is he a radical? Is he an "eye" buyer? For such a person,

(*Please turn to page* 31)

LINE and DESK

Ray Blain, A. I. E. E., Editor

Q.—Is it considered good practice to splice cloth covered switchboard cable if cotton sleeves are used to insulate joints in the conductors and the completed splice is well covered with friction tape?

A.—The splicing of switchboard cable in the manner mentioned or any other is not considered desirable or practical by most operating companies, and should not be resorted to except for temporary work on a cut-over or an emergency. If a part of the apparatus must be changed so as to require longer lengths of switchboard cable it is always the best plan to use all new cable.

Q.—Are electric peg-counters considered desirable on a manual switchboard?

A.—Electrically operated counters usually prove more desirable on switchboards of three or more positions, though they may be used satisfactorily on any switchboard. The mechanical type counter which mounts on the key shelf is generally considered adequate for small switchboards of one or two positions and are also considerably cheaper. With the electric counters push buttons are installed on the key shelf of each position and the relays and message registers on the relay rack or other convenient location where they may be read at regular intervals. Some so-called feature switchboards have an electrically operated counter on each position which automatically register all completed calls which is an ideal arrangement as a complete record of all traffic is always available. These automatic counters are always more accurate than a manually registered counter.

Q.—How should the pulling-in line be attached to cable on aerial construction for pulling the cable into the rings?

A.—The woven wire grip is considered ideal for all kinds of aerial cable work. On extra heavy pulls the ends of the grip should be bound down to the cable with tape or wire. Flexible wire cable yacht rigging is ideal for pulling-in line and a special link can be procured for attaching the line to the wire grip. A core hitch which is made by baring the conductors and attaching them direct to the line can be used but it is slow, wasteful and unnecessary with the modern woven wire grip available.

Q.—When are guard arms used on an aerial cable and what purpose do they serve?

A.—Guard arms are used to provide a place for terminating drop wires so that adequate climbing space may be maintained on jointly used poles. These arms are installed directly above the messenger and parallel with it and are usually held in place by the customary through bolt and one brace. Linemen in climbing the poles will step on the guard arm instead of the grounded messenger which is always desirable on joint construction.

Q.—Is it worth while on new construction to place lead sleeves on messenger so that cable can be pulled through them for splicing later?

A.—It is considered a very good idea to attach lead sleeves to suspension strand with marlin house line or lashing wire at all locations where tap splices are to be made. This eliminates the need of cutting the cable or the use of a split sleeve, neither of which are considered desirable.

Q.—Why are grade clamps considered necessary on aerial cable and where are they used?

A.—Grade clamps are used to prevent cable slipping or creeping on grades. When the cable slopes down from an end pole it is a good plan to place a grade clamp within 5 ft. of the pole. Also at cable cross-overs or railroad crossings grade clamps should be used. It is a safe plan to use them at any location where a creeping cable would cause injury to itself.

Q.—What is meant by "Rake" in poles?

A.—When the butt of a pole is set in from the line it is referred to as "Rake". This setting-in does not generally exceed 1 ft. to 20 ft. in heighth. Raking of poles tends to relieve the guys of a part of their strain and makes a stronger corner in general. Also should a raked pole give slightly it will not be so noticeable as one set perfectly perpendicular.

Q.—When should strain insulators be placed in guy wires?

A.—It is generally considered advisable to place strain insulators in exposed guy wires. A safe rule is to consider guys exposed when attached to pole which supports wires carrying a voltage of 250 or more. Strain insulators are not expensive and when in doubt it is always best to use one.

Q.—What is the function of the induction coil in a common battery telephone?

A.—The induction coil is made use of in various ways in the Common battery telephone, one of which is to place the receiver in a local circuit so that it will not be in the path of the direct current flowing over the line. Another is to provide a local circuit in which the transmitter produces variations in current which are repeated into the line by the induction coil with a booster effect.

Q.—What is the customary voltage of switchboard lamps?

A.—The voltages most commonly used are 12, 24 and 48, the two latter being the exchange voltages of commercial telephone systems. Lamps of various voltages some as low as 4 are used in circuits where the lamp does not receive the full exchange voltage due to it being placed in series with other apparatus of fairly high resistance.

Q.—What is meant by visual and audible signals on a telephone system?

A.—In the early days of the telephone it was common practice to employ audible signals only. As lines increased in number this system became quite confusing as it is most difficult for most people to distinguish similar sounds. This soon led to the development of the visual signal which is almost universally used in some form on line signals today. The night

(*Please turn to page 23*)

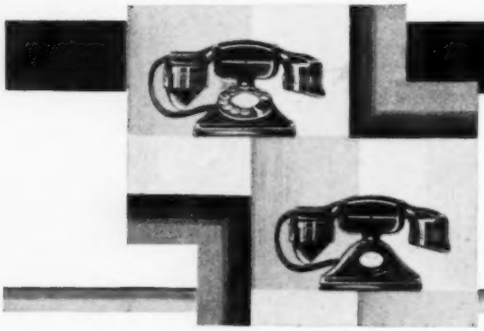
Your Territory Has Many P-A-B-X Prospts

A Typical Strowger P-A-B-X, with Front Cover Removed, Showing Its Attractive Appearing Cabinet and Sectional Construction Which Permits Easy Expansion When Desired.

There is a natural tendency to think of large and factories as comprising the field of applicativate Automatic Branch Exchange service. However, thores of others including schools, hospitals, public buleges, mines, arsenals, airports, banks, department storetels, institutions, ice plants, lumber yards, estates, pris— an endless variety, in fact.

Strowger P-A-B-X's are available in sizes to y requirement — from a few telephones to several hucific units are arranged for working with all types office equipment—automatic or manual—central batteeto.

A survey of your territory will undoubtedmany potential P-A-B-X users — a majority of whom consider older or less desirable services. Our engineadly assist you in making suggestions and preparing for individual prospects. Write for catalogs.



AMERICAN AUTOMC EL
1033 WEST UREN S

AUTOMATIC ELECTRIC COMPAN
CHICAGO

Sales Agents i
and oth

Exclusive Ex

AUTOMATIC ELECTRIC SA Y, LIMITED
AUTOMA SALES COMPAN

Ships and Yachts Are Excellent Prospects for Strowger Systems.
Hospitals and Similar Institutions Find Intercommunicating Service Invaluable.
Schools, Colleges and Universities All Need Interior Telephone Service.
Interior Communication Facilities Promote Efficiency in Factories.
Airports, Golf Clubs and Similar Organizations Are Vitally Interested in Intercommunication Service.

ELECTRIC SALES COMPANY
VAN BUREN STREET CHICAGO, U. S. A.

Sales Agents in U. S. and Possessions for

AMERICAN ELECTRIC COMPANY
CHICAGO

and other companies

Exclusive Export Distributors

1027 West Van Buren Street, Chicago, U. S. A.

SALES COMPANY, S. A., 22, Rue de Verger, Antwerp, Belgium

RAMBLINGS

By J. A. S.

Way down in Texas we found Oscar Burton, general manager of the Gulf States Telephone company more optimistic than one would expect under present conditions. Like a vast majority of others the company he manages has been showing consistent gains the past three months. Burton has kept the company money working right along through the past three years, and if others had followed his lead better service and better feelings would be noticed throughout the industry. An article for the December or January issue is in the course of preparation showing what this progressive company has accomplished during the lowest period in telephone history.

Rambler stopped off in Cape Girardeaux, Mo., and met a "passel" of employees busily engaged in maintaining the reputation of that very progressive company—the Southeast Missouri Telephone company. Here is found one of the best managed properties in Missouri, and one of the best equipped exchanges, too. This company has carried on construction work consistently and its officers are jubilent over the fact that installations have exceeded removals the past few months.

The Two States Telephone company at Texarkana, Texas-Arkansas, presided over by the Stuarts—father and son—has always been a favorite stopping place for Rambler, and as usual he was given a hearty reception when he arrived in the state-line city. The Stuarts stated that they too were encouraged by the prospects of continued gains. While the gains had been small it was felt with better prices for cotton, wheat, oil and other products of the South, seasonal gains should be held during the winter and coming spring.

At St. Louis we had an interesting conversation with our old friend, P. Kerr Higgins, who had just returned from an extended visit on the Pacific Coast and Hawaii. His description of the far west and some of the southern points visited will be a feature of a future issue of TELEPHONE ENGINEER. When P. Kerr talks everybody listens. Look for his article.

Reaching Dallas, Rambler called upon D. T. Strickland, general manager of the Southwest Telephone company and other allied companies. His organization has worked consistently through the past three years and has a record for gains that is hardly paralleled in any section except, perhaps, where more favorable conditions exist. Here, too, we found a cordial reception. Mr. Strickland gave "reasons for the faith within him" by producing figures to show the accomplishments of his companies.

Rambler and his son Ray were entertained with a luncheon by the Southwestern Bell Telephone executives while in Dallas. Around the table were Messrs. Prehn, Patterson, Biggs, Stewart and Young, representing the Southwestern Bell. At the last convention of the Texas Telephone Association the Southwestern Bell was voted membership in the Association and this group is now active in the work of extending the activities of affairs of both their group and Independents. In the Dallas group of the Southwestern Bell hospitality reigns supreme and this visit is looked forward to by the writer as one of the bright spots of his visit.

The colossal joke of the season in the south is the recent speech of Madame Secretary of Labor Perkins before the shoe manufacturers of Massachusetts, wherein she advised the makers of footwear to create new business by making the Southern states "shoe conscious," stating that considerable heretofore unexplored territory could be turned into fertile fields for the above industry through an intensive advertising campaign. This is considered by the southern tribe of U. S. Citizens as too humorous to be serious.

So far Rambler has found conditions favorable and the people well satisfied. Naturally they feel a great deal is to be accomplished yet before normal conditions will bcome a reality, the almost unanimous reports of gains in installations brings a note of cheer to those who have been continuously losing stations for twenty-five months. The Southwestern Bell, the Southwest Telephone company, Gulf States Telephone company, Two States Telephone company, each report gains, some report gains in excess of seasonal installations. One large company reported that the gains the first five days of November exceeded the first fifteen days of October, which indicated to the management that it was not altogether a seasonal gain as this period had passed in Texas.

GETS NEW SLANT ON TELEPHONE

(Boonville (Ind.) Standard)

While Amos Miller, a farmer living near Bedford Valley, Md., was in the local telephone office paying his bill and expressing his intention of having the telephone removed as an economy measure one morning recently, things were happening at home which gave him a new outlook on the entire subject of economy.

An outbuilding on the farm had caught fire, and the blaze, fanned by a high wind, threatened to spread to the barn and the farmhouse. Mrs. Miller called the telephone exchange at the very moment that Mr. Miller, in the telephone office, was considering the advisability of having his telephone removed. The operator on duty, Mrs. Wallace Nave, immediately spread the alarm, and within a few minutes neighboring farmers had arrived at the Miller farm and succeeded in confining the blaze to the building where it had its start.

Mr. Miller did not have his telephone removed. The one call undoubtedly had saved his farmhouse, his livestock and his barn and farm implements, and had emphasized, in particular, the value of telephone service on the farm. "I'll never be without a telephone," said Mr. Miller, "and any other farmers who take my advice won't either."

ABANDONS REPORTS

The Nebraska State Railway Commission has abandoned the idea of demanding monthly or quarterly reports by exchanges from all telephone companies operating two of more exchanges in the state, and recently issued an order dismissing from further consideration the question of periodical reports by exchanges from companies whose annual revenues are less than $50,000.

STILL'S INJURED

Mr. and Mrs. R. B. Still, Portsmouth, O., were injured recently when they were forced to drive their automobile off the highway to avoid striking a man walking along the road.

Mr. Still was confined to the hospital for several days, but, it is reported, that he and Mrs. Still are recovering from their injuries.

Telephone Operator: "It costs seventy-five cents to talk to Bloomfield."

Caller: "Can't you make a special rate for just listening? I want to call my wife."—Associated Magazines.

BELL COMPANIES REPORT STATION GAINS

ASSOCIATE companies of the American Telephone & Telegraph company report a substantial improvement in the number of telephones in service during recent months., Increases are displacing decreases which have prevailed for so many months and the increases have been of such a nature as to reverse the trend so evident during the depression.

While some of the companies report only small increases yet the change is significant and indications are that the gains will be further extended during the coming months. September, October and November are normally good months in the telephone industry during which period the number of stations in service shows an increase. More than a seasonal increase is being anticipated this year due to the fact that business recovery has made substantial headway.

The Southern New England Telephone company reported a net gain of 717 telephones in Connecticut during September, as compared with the same month of last year. In August there was a net gain of 139 telephones. Installations during the first nine months of this year totaled 2,600, a decrease of 7 per cent from 1932.

The New England Telephone & Telegraph company reported a much smaller loss of stations in September than for the same month last year. The loss was 2,470 as compared with 10,830 a year ago. During the first quarter of 1933 the net loss was 22,660 stations as compared with 30,214 in 1932 and for the second quarter the net loss was 4,855, against 27,964. The third quarter report failed to show the substantial improvement as was reported in the second quarter. The net loss of telephones in this quarter totaled 10,593 as compared with 23,006 in the third quarter of 1932. For the first nine months this year the net loss amounts to 38,108 telephones as compared with 81,184 in the corresponding period of 1932.

The Chesapeake & Potomac Telephone company of Baltimore reported a net gain of 938 stations in Baltimore and a net gain of 374 telephones in the entire State of Maryland. This was the first monthly gain since December, 1931.

The New York Telephone company during September had a net gain of 9,912 instruments, against a loss of 11,167 for the same month of 1932. August had shown a drop to a loss of 7,008 telephones from the 20,402 loss of July. Average loss for this year, it was said, was 15,898 monthly.

The New York system, which is the largest affiliate of A. T. & T. and which gives approximately 20 per cent of the telephones to the Bell system, showed a net loss of 117,274 telephones for the nine month ended September 30, 1933, against a loss of 200,697 for the same time in 1932.

The Illinois Bell Telephone company reported a net gain of 6,753 for its system. In Chicago, 5,688 new telephones were installed, compared to a loss of 2,270 in September, 1932. Suburban and downstate territories gave a gain of 1,065 instruments, against a loss of 4,242 in September a year ago.

Previously three other units of the Bell system had reported a change in the trend of the number of telephones supplied by the system. The Pacific Telephone & Telegraph company reported a gain for August and for the first two weeks of September, while the Wisconsin Telephone Company announced a net gain of 1,000 telephones in the first twenty days of September.

The Bell Telephone company of Canada reports that the previous downward trend in the number of the telephones in service has been reversed with installations exceeding disconnections. August, which is generally a quiet month, showed a "remarkable increase, which was well sustained in September," according to an official statement from the company.

LINE & DESK: QUESTIONS AND ANSWERS

(*Continued from page* 19)

alarm, an audible signal, which operates in conjunction with the visual line signals is quite necessary in a small exchange as it permits one operator to handle a large board effectively at night and in some small exchanges even sleep during the hours of light traffic. The fuse alarm must also be audible so that it will attract attention immediately and a visual signal which will direct the attention of the man in charge to that part of the apparatus where the fuse is blown is also desirable. Telephone stations must have an audible signal in most cases, however a lamp signal is often used in large offices where a constant ringing of bells would be annoying.

Q.—What is meant by the straightforward method of trunking?

A.—This method eliminates the order wire or call circuit and the conversation between the two operators is carried on directly over the trunk used later by the two subscribers. This is actually the original method of trunking which was later discarded in favor of the order wire which became quite burdensome in large offices, hence the return to the use of the old and tried method.

Q.—Is it considered advisable to keep spare operators headsets available?

A.—In the interest of good service it is considered necessary to have one headset for each operator and at least one spare available at all times. Operators as a rule object to using each other's headsets and neither is this practice desirable from a sanitary and health standpoint. A wall type headset cabinet with suitable compartment for each headset is an ideal arrangement for any telephone exchange.

Q.—Is it considered advisable to plug-up all vacant jacks in a switchboard?

A.—This practice probably cannot be considered as a necessity but it is believed a good idea to use vacant number plugs in all unused jacks. This arrangement provides an easy method of checking vacant numbers and insures against the operators plugging-in and ringing on a vacant line. This type of plug can be purchased at an extremely low cost and it is believed will prove a worthwhile investment.

LAUNCH "NEW DEAL"

The Lorain (Ohio) Telephone company has launched a "new deal" for former subscribers who are returning to jobs after long unemployment and desire to have their telephones reconnected, it was announced by H. E. Hageman, treasurer of the company.

Under the terms of this new deal, the old subscribers can have their phones hooked up without paying their delinquent bills as previously required.

"We have worked out an easy-payment plan whereby they can pay the installation cost and a portion of their delinquent bill," Hageman said. "The agreement with the various subscribers differ, depending upon the amount they owe. The only thing that we ask is that they get them paid up in from six to twelve months."

Letters have been sent out to hundreds of former patrons of the company urging them to call at the office and see what can be worked out.

NEWS FROM THE FIELD

The fight to remove the extra charge for cradle type telephones in Ohio is settled so far as the state utilities commission is concerned.

Rejecting the application of Cleveland, the commission has refused to order the Ohio Bell Telephone company to cease collecting 25 cents extra each month for the one-piece instruments.

The International Telephone & Telegraph Corporation has completed arrangements for the extension of six months its New York bank credits from August 1.

According to the arrangements it is anticipated that $1,000,000 of these bank loans will be paid off reducing the total to $26,000,000. Total notes and loans payable to banks on December 1, 1932, amounted to $40,449,271, including the New York bank credits of $27,000,000.

The remodeled recently purchased Central Illinois Consolidated Telephone building at Pana, Ill., acquired by the company several months ago by purchase from Mrs. Warren Penwell, has been completed and is now occupied as the offices, exchange and switchboard rooms, repair department and reception rooms, as well as long distance booths and private offices of the employees and office force.

B B. Griffiths, formerly commercial superintendent of the Northern Texas Telephone company, headquarters at Sherman, has arrived in Bonham and succeeds J. I. Boon as manager there.

Mr. Boon has been manager of the telephone company in Bonham for the past 16 years. He has been actively identified with the social, civic and commercial life of that city in every capacity that demanded his services. He was secretary of Fannin County Fair from its beginning up to a few years ago, rendering very acceptable and deserving service. The Favorite frankly states that much of the success of the worth-while institution is due to the efforts of Mr. Boon. Mr. Boon was also secretary of Bonham Junior Chamber of Commerce, giving his time and energy free in that direction. As a Rotarian, Mr. Boon has been faithful and active in its behalf.

According to reports the C. & P. Telephone company in West Virginia has absorbed the old Harrison-Doddredge Telephone company lines running into West Union, permission in a recent decision. Two other small lines were taken over by the same company.

The Interstate Commerce Commission has authorized the acquisition by the Chesapeake & Potomac Telephone company of West Virginia of the telephone properties of J. Roy Watson and A. G. Hudkins, who operate a telephone business in West Virginia.

The properties to be acquired consist of twenty-three switching boards serving 260 subscribing stations and 960 service stations.

The Weyauwega (Wis.) Telephone company has a crew of men excavating a basement in preparation for the new telephone exchange.

Several farm lines out of Woodburn, Ia., are now operating out of Ottawa just north of Woodburn. It is reported that six lines are hooked up with a central switchboard.

It is also reported that the Bell system has agreed to hook up with the new central as soon as the station secures ten rural lines.

The State Utilities Telephone Exchange building in Oconto, Wis., is undergoing extensive remodeling and redecoration.

A concrete block foundation is being put underneath the complete structure. New tin is being placed on the sides and front, and the interior of the building will be remodeled. Both the interior and outside are to be redecorated.

Postal telegraph service has been added to the service given its patrons by the Weyauwega - Fremont (Wis.) Telephone company. Through wires for all classes of service now extend from the Weyaukega office. George Dobbins is the head of the Weyauwega-Fremont Telephone company.

The Nebraska railway commission granted the Central Nebraska Telephone company authority to establish uniform rates on business and residence telephone extensions and extention bell service at nine exchanges. The rates, $1 per month for business extensions, 50 cents for residence extensions and 25 cents for extension bell service, are effective at Brady, Grant, Imperial, Keystone, Maxwell, Palisade, Sutherland, Venango and Wellfleet. Prior to the order, the charges varied at different exchanges.

A state-owned telephone line is being erected between White Cloud and Brohman, Mich., for use for the various fire towers in Newaygo and Lake counties. It also will be accessible to the public in emergency cases. The work is being done by members of the C. C. C. camps.

When the line is completed it will connect the Baldwin station, Brohman fire tower, Barton fire tower and the Star Lake fire tower and also the new substation that will be completed at White Cloud. It is expected the line also will run to the fire tower at Newaygo lakes. This will give connection through Baldwin to the towers at Peacock and north.

The line will be connected with the White Cloud telephone office and conservation officers will have a direct line to any tower in the district.

Representatives of six Chautauqua county (New York) telephone companies are seeking Public Service commission consent to take over the capital stock of the Ripley Telephone company and operate the company together in neighborly manner.

The Ripley company was owned by the late Alfred Huntington. Since his death it has been conducted by his widow. She testified she is anxious to sell to the companies seeking the concern—the Dunkirk & Fredonia Telephone company, Mayville Telephone company, Ashville & Panama Telephone and Telegraph company, Portland Telephone company, Sherman Telephone company and Westfield Telephone company.

The Grundy (Ia.) town council has passed a resolution asking that telephone poles and wires erected by the Mutual Community Telephone company be removed. The company suspended business a month ago.

The franchise that was voted the company by the town last winter has expired for the reason that it contained a provision that it must be formally accepted by the company within a 30-day period. The company failed to exercise their option for a formal acceptance, which nullified the franchise.

G. H. Echols, owner of the Wishbone Inn at Davenport, Iowa, has a valuable police dog that sometimes wanders from home. Mr. Echols now has his telephone number stamped on his dog's collar, and this has been the means of having the dog returned to him six times in recent months.

Crapo
GALVANIZED PRODUCTS

Steel Strand
• • •
Telephone Wire

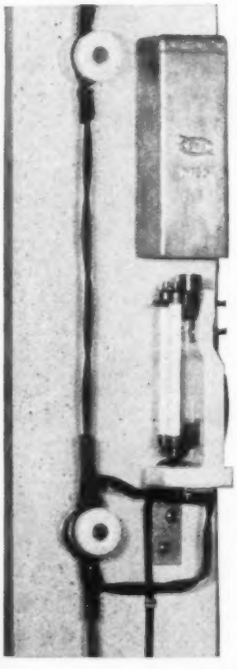
ECONOMIZE with safety by using *Crapo* Galvanized Steel Strand and Wire on all new and replacement jobs.

The heavy, pure zinc coating, thoroughly bonded to the wire, resists corrosion, increases durability and substantially lowers maintenance costs.

Be sure to specify genuine *Crapo* Galvanized Products! Representative Jobbers in all principal jobbing centers are ready to supply you on instant notice.

Indiana Steel & Wire Company
Muncie, Ind.

COOK INDOOR OUTDOOR



STATION PROTECTOR
TYPE O-7

●

Mounted outdoors it keeps high potential out of subscriber's premises.

Adequate protection at low first cost and low maintenance cost.

Always accessible when mounted outdoors.

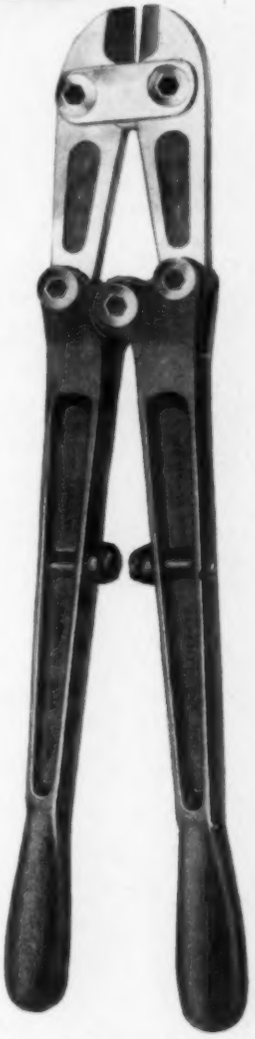
●

MANUFACTURED BY
COOK ELECTRIC COMPANY
2700 SOUTHPORT AVENUE CHICAGO, ILLINOIS

NRA MEMBER U.S. WE DO OUR PART

Vacuum Grip
REG. U.S. PAT. OFF.

BOLT & CABLE CUTTERS



Linemen know the difference!

ANY LINEMAN who has ever used these "super" cutters will tell you that there's nothing to equal them for cutting power and ability to stand up in hard everyday use. That's because they're built to take punishment. Designed with an extra factor of strength.

Hammer-forged steel handles—not malleable cast steel that snaps under heavy strain. A rugged joint, constructed on a new compound lever principle, to give the utmost in leverage and power. Cutting blades of our own formula electric furnace high carbon alloy steel — the last word in toughness.

Small wonder that Vacuum Grip Bolt and Cable Cutters are gaining daily in popularity among Linemen —and Telephone Companies as well. There's substantial economy in the long life of these wear-resisting tools.

All Vacuum Grip Bolt and Cable Cutters are six inches shorter than cutters of other makes, with equal cutting capacity.

No. 114—14" LINEMAN'S SPECIAL. Cutting capacity 5/16". With side-cut blades, $4.00. With end-cut or diagonal-cut blades, $4.40.

No. 118—18"—Cutting capacity 3/8". With side-cut blades, $5.00. With end-cut or diagonal-cut blades, $5.50.

No. 124—24"—Cutting capacity 1/2". With side-cut blades, $6.50. With end-cut or diagonal-cut blades, $7.00.

No. 136—36"—Cutting capacity 5/8 to 3/4". With center-cut blades, complete, $9.00.

All blade assemblies quickly interchangeable as a unit.

Diagonal-cut Blades

EXTRA HARD CENTER-CUT BLADES for hardened materials furnished at small extra cost.

End-cut Blades

PURCHASING AGENTS: Write for special prices on lots of one-half dozen or more, for running tests.

Forged Steel Products Co., Newport, Pa.

OVER ONE MILLION VACUUM GRIP PLIERS IN USE

BOOSTING REVENUE BY TELEGRAPH

(*Continued from page* 17)

phone men as to whether these organizations were fully adapted to requirements of rendering an adequate telegraph service and fears were expressed either that the one might interfere with the other in operation, or that competition with telegraph would hurt the telephone toll revenue.

Successful From Start

It is pointed out that experience in the past few years has convincingly proven these fears to be unfounded, and may be deduced from the rapid adoption of this plan in many parts of the country, and its continued extension by Independent companies now operating it in one town to their offices in other towns. The plan was successful from the beginning and fully justified the hopes of the telegraph and telephone company, both as to quality of service that could be rendered and the acceptance of it by the public, it is said.

During the two years since the first experimental installation nearly 1500 new telegraph offices have been established with Independent telephone companies in some thirty states. Telephone employees have shown that their training fitted them to readily adopt themselves to handling telegrams as part of their formal duties with accuracy and speed. Continuous 24-hour service has been greatly appreciated by the public which relies on telegraph in so many emergencies.

Success of the plan is due primarily to the high average return to the telephone company from the individual telegram making it possible for a substantial additional revenue to be obtained from handling of a small number of well-paid messages. This substantial revenue is derived without any additional labor or plant investment. Telephone employees can easily handle the telegraph traffic along with their regular duties and when traffic justifies it, the telegraph company loans printing telegraph apparatus, which may be superimposed on telephone toll lines so that no telephone circuit time need be used.

Signs, Advertising Supplied

In all cases, the telegraph company supplies signs, advertising material and stationery. The fact that the business is carried on in the name of the telegraph company, and that the company assumes all legal and financial responsibility for it, relieves the telephone company of any risk in connection with claims or of losses through uncollectible accounts. Advertising and soliciting for telephone and telegraph services can be conveniently and effectively combined while the telegraph company can give many valuable sales leads and much assistance.

As regards the possible competition with the existing telephone toll service, it is pointed out that the telegraph service already exists in towns in which Independent companies are located, though perhaps not in the most satisfactory form. The testimony of Independents who are conducting telegraph service is unanimous that no unfavorable reaction has been felt of the telegraph service on their telephone toll service. And in practice, it is reported that there is no congestion of the telephone circuits, as wherever there is a substantial amount of telegraph traffic it is handled by printing telegraph machines working over simplex circuits superimposed on telephone circuits which do not interfere with telephone use.

Millions in Revenue

The telegraph-telephone plan gives Independent telephone companies access to many millions of dollars of telegraph revenue which now is being developed in the communities served by them, but in which they at present participate only in the smallest degree, although it is communication business which rightfully belongs to the telephone companies as the logical communication centers of their communities.

Under present conditions, telephone companies must bend every effort to improve their financial results and must increase their revenues without increasing their invested capital. We believe the telegraph-telephone plan presents an opportunity for meeting these two seemingly contradictory requirements and we earnestly urge telephone men to examine and consider its possibilities most seriously.

Coming Next Month

"Why Not Sell Program Service?"

A Revenue Producer

BUYS COMPANY

President James N. Cox announced the acquisition of the Van Buren Telephone company at Spencer, Tenn., by the Southern-Continental Telephone company.

If your prospect is looking for work, more than ever he needs a telephone.

HIGH TRIBUTE PAID TO R. C. ROTTGER

The high esteem in which R. C. Rottger, vice-president of the Indiana Bell Telephone company, who passed away October 10, was held by the citizens of Indianapolis and by the members of his company and the loss that his death has meant to the telephone industry was portrayed in an editorial of the Indianapolis Times, which follows:

"Indianapolis can ill afford to lose the unselfish service of Russel C. Rottger. The community is confronted with another depression winter. It faces months that will bring heavy problems as the city and nation creep back along the road to recovery.

"Mr. Rottger always was ready to give himself wholly to public service. He never asked anything for himself. Public commendation embarrassed him. Yet his sound judgment and good cheer invariably were back of every altruistic municipal endeavor. His reward was in just doing things for people.

"He was a comparatively young man. His company, the Indiana Bell, had advanced him rapidly to a vice-presidency. He was the antithesis of the old-fashioned public utility executive. It was his belief that a public utility was a public trust and his mind was constantly thinking over the problem of how his company would give better and cheaper service.

"The fact that he was a company official never inflated him. He was not too self-important to go out personally on a trouble call. Thousands of telephone subscribers came to know him in this way. It is a pity that he now never will have an opportunity to work out some of his plans for bringing telephone service even closer than it is now to the individual subscriber.

"Most of all he will be missed by his friends. He had a rare capacity for friendship. Mr. Rottger leaves behind the best of all memorials—a life of real accomplishment for his fellowmen."

OPERATOR SAVES EIGHT

An alert operator in the Athol, Mass., telephone exchange who read trouble signs in the erratic blinking of lights on her swtichboard gave an alarm that resulted in the awakening and escape of eight persons from a smoke-filled building. The operator, Miss Agnes Glasheen, noted the queer behavior of the switchboard lights and notified police, who roused all occupants of the apartments in the upper floors.

Cranks are the very dickens to have for customers, but they sure do find out whether you mean it when you talk service!

Every TOLL CALL
is "well in hand."

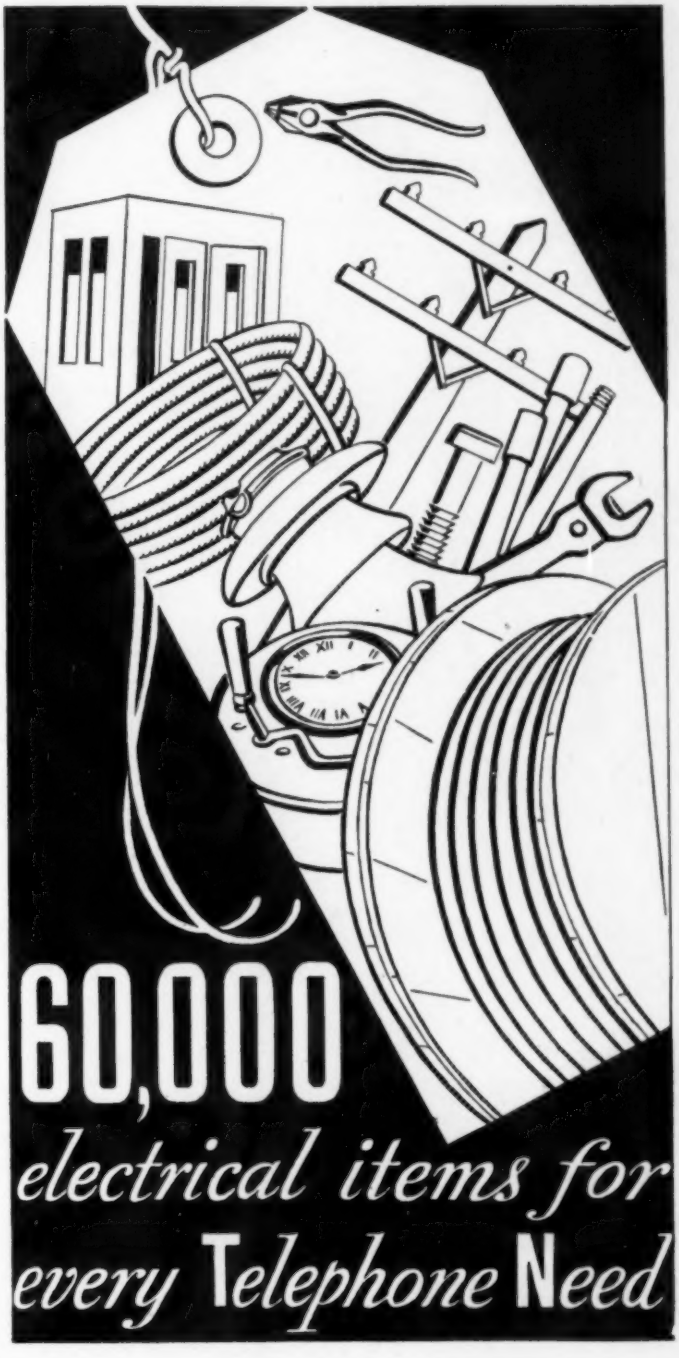
Elapsed Time Records PRINTED TO THE SECOND

To cut down the losses from overtime allowances on toll messages, a new model Calculagraph, No. 30, has been constructed which will print elapsed time to as small a division as one second. This model is equipped with a self-starting, synchronous motor for 60 cycle, and either 25 or 110 volts regulated alternating current. The mechanism is so designed that it can be fitted to the Model 6 spring driven Calculagraph at a reasonable cost.

Sample imprints sent anywhere in the world on request. Please state the serial numbers of Calculagraphs now in use in your exchange, and estimates for converting them to the Model 30 will be provided.

THE CALCULAGRAPH COMPANY
50 Church St. Dept. 22 New York City

CALCULAGRAPH
THE ELAPSED TIME RECORDER



60,000 *electrical items for every* Telephone Need

In these days when everyone is looking for purchasing economies, Graybar's service of supplies makes economies possible . . . It brings 60,000 electrical items within arm's reach of the telephone user. Does away with "shopping" around. Eliminates expensive stocks . . . The natural result of Graybar's long experience in meeting the special needs of the telephone industry—an experience that goes back to the beginnings of that industry in America.

Graybar

Offices in 73 Principal Cities. Executive Offices: Graybar Bldg., N. Y.

WHY I LOST THAT SALE

An enterprising telephone supervisor has compiled a list of reasons why orders for telephone service are lost. It is good enough, we think, to print. Maybe you will read something that applies to you. Here they are:

1. I lost an order because I was afraid the customer would say "No," so I did not even go to see him.

2. I tried to sell a customer service or additional service without knowing anything about the prospect's business or needs, or what telephone facilities he already had.

3. I lost a sale because I did not know off-hand the cost of a two-party line, an additional business line, and extension, an additional listing, etc.

4. I lost a sale because I really did not have enough facts about the value of telephone service or auxiliary service to prove that what I was trying to sell was worth the money.

5. I neglected calling upon my prospect for so long that another employee beat me to it.

6. I let myself get into an argument with a future customer—which I won. That is why I lost the sale.

7. I accepted too willingly the prospect's objections. He said he would not buy until after New Year's, or after the depression was over, and it did not occur to me that that was not really a good reason.

8. I talked too much about my product and about the telephone company, and did not emphasize enough the value of the service to the customer.

9. I talked myself into a sale—then talked myself out of it.

10. I had nothing newsy or fresh to offer the customer, who, it appears, had heard a lot about my product from other employees.

11. I tried to "high pressure" the prospect. If I had been willing to wait, he would have bought later, and willingly. As it is, I have shut the door in my own face.

12. I did not talk to the right person in the store or organization. The person I interviewed could not have authorized the sale, anyway.

13. I contracted a customer who was angry at the telephone company, for some reason not known to me. I failed to ascertain whether his grievance was justified, and should be brought to the attention of my superiors for proper corrective action. I was not salesman enough to rewin his good will.

14. I talked with a customer about one item of our service that I wanted to sell, and when he was not interested in that particular item, I failed to discuss with him a number of our other services that might have appealed to him and resulted in a sale.

15. I lost a sale because I did not know but what that large house owner had an extension telephone, and did not bother to find out.—*Indiana Telephone News.*

"Tom & Co."

YOU know them. They live in your town. Their prospects are brighter now, but the experience they have been through has left its mark in a way they may not suspect—tuberculosis is always "around the corner" for people who undergo hardship.

Help your local tuberculosis association protect them. Christmas Seals finance a nation-wide program of free clinics, tuberculin testing, X-rays, nursing service, education, and other activities.

The National, State *and* Local Tuberculosis Associations *of the* United States

Buy CHRISTMAS SEALS

HAS GROUP INSURANCE

A group life insurance policy has recently been acquired by the Citizens Public Service company of Missouri, operating a telephone system, with headquarters at 411 Olive Street, St. Louis, Mo., for the protection of 91 employees.

According to the arrangements of the policy the workers are eligible to insurance coverage in amounts ranging from $500 to $2500, the rank or position held being the determining factor.

MRS. WATTS DIES

Mrs. Florence H. Watts, wife of George Watts, owner of the Knightstown (Ind.) Telephone company, died of pneumonia in Indianapolis. She was born in Knightstown and had lived in the Philippine Islands, Chicago and Indianapolis.

...all made to Bell System standards

You can depend upon Western Electric Telephone Cables for long, uninterrupted service — made possible by the extreme care given by Bell System cable specialists to each detail of design, raw material selection and manufacture.

Western Electric produces cable for every telephone need. There are cables for overhead and underground installation (either in conduit or buried right off the reel). There are terminating cables and submarine cables. Each is made to standard or special specifications by the makers of Bell Telephone apparatus. For full details, whatever your telephone cable needs, write to the distributors — Graybar Electric Company, Graybar Building, New York, N. Y.

Western Electric

LEAD COVERED CABLE AND TELEPHONE APPARATUS

Distributed by GRAYBAR ELECTRIC CO., *Offices in 73 Principal Cities*

HIRE ADDITIONAL MEN FOR CABLE WORK

The Monroe (Sparta, Wis.) County Telephone company has been doing some underground work in the past few weeks that has given employment to eight or nine men in addition to their regular crew.

Approximately 3500 feet of 25 pair cable and 1500 feet of 50 pair cable is being laid and will improve the efficiency of the system just that much, besides providing extra work for people that needed it. The telephone company officials state they could have gotten along without these improvements, but they felt that there is no time like the present to do the work when labor and material is cheap and when men need the work.

STAYS IN WACO

H. W. Stewart, newly appointed executive secretary of the Texas Telephone Association will maintain his offices in Waco until the first of the year, according to a recent report. It is expected that after the first of the year he will move his headquarters to Austin.

VALUABLE MAGAZINE

The West Coast Telephone company of Everett, Washington, is to be congratulated for getting out such an interesting house organ for its employees. *Crosstalk* is the name of this booklet and we certainly look forward to it each month. Interesting information about sales campaigns, monthly messages by William E. Everett, sales manager and E. R. Hannibal, general manager, personal news items, etc., make the magazine valuable to both the company and the employees.

? ? ? ? ? ? ? ? ? ? ?

When Your Problems Raise Questions

? ? ? ? ? ? ? ? ? ? ?

If you keep posted, month to month, regarding developments in the engineering, commercial and managerial ends of the telephone industry through contents of this journal, you will have a fund of information that may save you hundreds, possibly thousands of dollars.

Each issue of this journal devotes itself to presenting data beneficial to you.

Order a copy sent to you Personally each month.

TELEPHONE ENGINEER PUBLISHING COMPANY

185 N. Wabash Ave. Chicago, Ill.

L. M. BERRY DIRECTOR OF TELEPHONE ENGINEER

Loren M. Berry, president, L. M. Berry and company, Dayton, telephone directory advertising sales organization, was elected a member of the Board of Directors of TELEPHONE ENGINEER PUBLISHING COMPANY at the annual stockholders' meeting in October to fill the vacancy on the board caused by the recent death of Harold L. Beyer.

L. M. Berry

Other directors elected were J. A. Smith, F. A. Bowdle, Walter J. Uhl, P. Kerr Higgins, John H. Wright, Dr. C. L. Jones, D. Weiner and Ralph C. Reno.

IMPROVES OFFICES

Extensive improvements are being made in LaPorte City, Ia., by the Farmers Mutual Telephone company. There is a vestibule inside the front entrance for use of patrons of long distance, who thus need not enter the office proper, and the counter has been turned to extend across the room. Wire netting which was an obstruction to light, has been removed. The walls also are being redecorated.

SHOW A GAIN

The return of better times is seen by officials of The Home Telephone & Telegraph company, Ft. Wayne, Ind., who stated that September was the first month in more than two years in which telephone installations exceeded disconnections. The latter part of August showed a slight increase and September a substantial gain.

SALES CONTEST GOES OVER THE TOP

The exciting sales contest which was staged throughout the past month by employees of the Citizens Independent Telephone company, Terre Haute, Ind., was brought to a close last month.

And what a contest it was. Probably the best way of telling just how successful it was is stating that the employees set as their goal 204 new sales, which was considered a high one "to shoot at," and when final figures were tabulated they revealed that 210 new sales had been made. That is what can rightly be termed as "going over the top."

The "blue army", led by Sam Dibble as captain, won first position with the largest number of sales in the three-way team contest.

Hot in pursuit and coming within six sales of the leaders was the "white army" captained by Mrs. Mary Gfroerer.

Third on the list, but always a dangerous contender, was the "red army," captained by Aubrey Boyd.

Mr. Dibble, by reason of having been captain of the leading team, will be awarded a cash prize and in addition four employees, members of the various teams, were awarded trips to the World's Fair at Chicago.

Those winning the coveted trips to A Century of Progress were Mrs. Mary Gfroerer, Charles Crane, Dennie Ogle and Herman Dant.

WINS FIRST PLACE

Years of successfully schooling the operators of its own fleet of cars and motor trucks in safe-driving measures, has brought another honor to the Lincon (Neb.) Telephone & Telegraph company, which has been unequalled by other Nebraska utility companies. Word has been received by General Plant Superintendent M. T. Caster that the company fleet of cars won first place in the National Safety Council's contest among companies operating motor fleets throughout the United States.

The telephone company, the council reported, for the first six months of this year, operated 158 trucks and cars, a total distance of 746,702 miles with less than one accident per 200,000 miles. It is the second time that the company has received a safety award since it entered the contest three years ago.

PURCHASES EXCHANGE

Ray Schwalm of this city has purchased from the Citizens Public Service company, the telephone exchange at Hume, Mo.

SELLING DISCUSSED AT ILLINOIS MEETING

(*Continued from page* 18)

an appeal is made to the eye, which is ten times more effective than an appeal to the ear. An illustration would be to refer to the hands of a watch, stating that every time the second hand moves, there is a fire. He continued:

"After the 40 or 50 questions have been analyzed in respect to a prospect, his specific needs for service are figured. Then evidence is gathered to support the need for the service.

"The next step is to gather outside help. If a man has his farm home insured, talk to the insurance man. Ask him to help, for a telephone helps to reduce the fire loss and it is to the insurance man's advantage that a telephone be installed. See the doctor; tell him to ask the farmer, when he comes to his office, why he hasn't a telephone so he can call him in case of an emergency.

"Go to the fire chief, the merchants. Every new telephone is an outlet for goods and it is to the merchant's advantage to aid the company in getting subscribers. We are part of the community and must get help to sell service.

"The next step in preparatory selling work is the answering of stock replies. You must be prepared with answers to stock replies, whether he lives in a twilight zone, has an automobile, etc.

"Preparatory work concluded, the next step is the interview. First, you must sell yourself. Second, is the setting of the stage. Pick out the place for the interview, for there are lots of things that can be done to help yourself. Some salesmen like to sit in the kitchen. Personally, I like to go to the barn and talk to the farmer there or outside the buildings sitting on a plow.

"Don't talk selling with a lot of hangers-on around. Sit side by side with your prospect on the same side of the fence. The third step in selling is to be sure you stress the specific need for the service. The fourth step is closing the sale. Sometimes, you fail to recognize the psychological moment to get the card out for signing. Usually, you can tell when the prospect is ready to sign.

"The last step in the selling set-up is leaving the prospect. If you fail to sell your prospect, do not go without leaving the door open so that you can come back. If a prospect signs, stop talking about the telephone. Don't talk yourself out of a sale."

R. G. Roadstrom, Galesburg, read the report of the Auditing Committee.

E. D. Glandon, Pittsfield, presented the Resolution Committee's report. Appreciation to directors and officers for their service and the speakers were thanked for their participation on the program. Also Houch McHenry, Jefferson City, Mo., Charles C. Deering, Des Moines, Iowa, and W. H. Beck, Indianapolis, were thanked for attending the meeting.

At the Thursday morning business session, the following directors were elected:

A. R. Bone, secretary-treasurer, Illinois Bell Telephone company, Chicago; C. R. Brown, vice-president in charge of operations, Illinois Commercial Telephone company, Springfield; George X. Cannon, general manager, Northwestern Telephone company, Freeport; Donaldson Coombes, connecting company agent, Southwestern Bell Telephone company, St. Louis, Mo.; E. D. Glandon, secretary and manager, Pike County Telephone company, Pittsfield; J. G. Hardy, commercial superintendent, Illinois Commercial Telephone company, Springfield; Dr. R. E. Gordon, president and manager, El Paso Telephone company, El Paso.

H. A. Josyln, secretary and general manager, De Kalb-Ogle Telephone company, DeKalb; H. G. Lankford, general commercial agent, Illinois Bell Telephone company, Chicago; R. A. Lumpkin, president, Illinois Southeastern Telephone company, Mattoon; R. L. Parker, manager, Geneseo Co-operative Telephone company, Geneseo; A. R. Patterson, general superintendent, Illinois Valley Telephone company, Streator.

Mr. Pitcher, Mr. Roach, R. G. Roadstrum, secretary and manager, Intra State Telephone company, Galesburg; Dr. Schwarz and Earl Stice, general manager, National Trail Telephone company, Altamont.

The officers were reelected at a meeting of the directors, following the close of the convention on Thursday noon, as follows: president, Dr. Schwarz; vice-president, Mr. Bone; secretary-treasurer, Mr. Parsons; and general counsel, Mr. Boynton.

NEW POLES AND CABLES

There's going to be new whittling material on the Marshfield (Mo.) public square. L. H. Garst, manager of the Webster County Telephone company, announced that several new telephone poles are to replace old ones, which bear deep marks of whittlers' knives. Cables also are to be replaced, Mr. Garst said.

E. J. PIETZCKER DIES

Ezra James Pietzcker, former Southwestern manager for the General Cable company, and well-known in the telephone industry, died October 18 at his home in St. Louis. Mr. Pietzcker, 75 years old, died of heart disease.

He was connected with the Standard Underground Cable company before it was absorbed by the General company.

Calvin P. Russell, secretary of the Lincoln Telephone & Telegraph company, Lincoln, Neb., has just completed his twenty-eighth year as a telephone man, all of his service being with the Lincoln company.

LENZ CORDS, CABLES & WIRES

THE ACCEPTED STANDARD
By Many Telephone Companies

Cords- for all makes of telephones and switchboards.

Cables- lead covered and braided types, silk and cotton insulated for switchboards and interior telephone systems.

Wire- silk & cotton insulated, Flame-proof jumper wire.

Lenz Electric Mfg. Co.

(Formerly Runzel-Lenz Electric Mfg. Co.)

1751-7 N. Western Ave. Chicago

NEWS OF MANUFACTURERS

TWO COMPANIES ORDER KELLOGG BOARDS

The Galena-Reed Springs Telephone company, Galena, Mo., recently purchased a Kellogg magneto switchboard for installation at its new Reed Springs exchange. Previously Reed Springs was served by rural lines running out of the main exchange at Galena. To improve service and care for the growing number of subscribers, the company decided to erect an exchange and install new central office equipment at Reed Springs. Located in the famous Ozark country, Reed Springs caters to tourists and vacationists throughout the summer. Consequently, reliable equipment was essential because many of the visitors kept in contact with their homes and businesses by telephone.

The Blue Earth Valley Telephone company of Minnesota, recently ordered a Kellogg 2-position, 6-800 Masterbuilt switchboard for installation at its Wells exchange. Consequently subscribers of the Wells exchange will soon be enjoying a fast, modern service. W. A. Eckles is president of the Blue Earth Telephone company, which also operates exchanges at Elmore and Winnebago.

ANNOUNCE NEW SCREW AND BOLT GAUGE

To allow the quick and accurate selection of the proper Rawlplug for any given wood screw or lag screw, The Rawlplug company, inc., general offices and works, 98 Lafayette St., New York City, and branches in all parts of the United States, has just developed something entirely new in the form of a gauge.

It is a gauge which, upon inserting a wood or lag screw between the jaws or slots, will instantly show what size Rawlplug should be used, and vice versa.

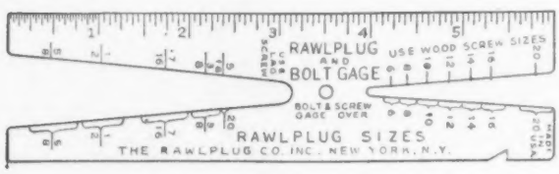
It is made of heavy polished, anti-corrosive steel six inches long by one and five-eighths inches wide, which allows it to fit into the pocket or a kit.

One face shows all standard wood and lag screw sizes and gives the corresponding sizes of Rawlplugs to be used with each. The other side shows all standard Rawlplug sizes and corresponding screw sizes to be used with each. It is also calibrated in fractions of an inch to determine bolt sizes from 3/16 inch to ¾ inch, can also be used as a caliper on corresponding sizes of round bars.

One edge forms a six-inch rule, graduated by sixteenth inches, and the other forms a five-inch rule with a slot which permits the accurate measurement of counter sunk head screws.

It is the one rule with which you can measure the exact depth of anything as the scale starts on the exact end. It is, therefore, many gauges in one, and the indications are that it will fill a long felt want, and be most popular.

The sale price is 50 cents, but any reader of this paper, writing on their business letterhead and mentioning this paper will receive one free of charge, providing they will send ten cents in stamps to cover mailing charges.



A New Rawlplug Screw and Bolt Gauge.

NEW ELECTRIC BLOWER

The Breuer Electric Manufacturing company, 852 Blackhawk St., Chicago, announces a new portable electric blower, the Tornado Model 10, for blowing dust out of telephone switchboards, motors and machines, and parts of all kinds, stock rooms or any space that collects dust or dirt. Tremendous power in small space and with light weight is an outstanding feature of this new blower. It employs a 1 H.P. ball bearing motor which, combined with a specially designed fan, gives 46½ inches water lift.

ADDS TO PAYROLL

Hygrade Sylvania Corporation, manufacturer of incandescent lamps, radio tubes, broadcasting equipment and other electronic devices, with plants at Salem, Mass., Emporium, Pa., St. Marys, Pa., and Clifton, N. J., increased its employees by over 1400 between June 17 and August 17. Payroll increases for this eight week period are at the rate of $1,000,000 yearly, or over 35 per cent.

F. H. LEGGETT ELECTED W. E. TREASURER

F. H. Leggett has been elected treasurer of the Western Electric company to succeed F. L. Gilman, who retired October 31.

Mr. Leggett started as a clerk in the company after graduation from Dartmouth in 1898. For seven years he held executive posts in what were then its foreign subsidiaries, being secretary of the Nippon Electric company in Tokyo and later manager of the Bell Telephone Manufacturing company in Antwerp. Since 1921 he has been in New York as one of the chief executives in the nation-wide distributing organization through which Western Electric supplies the Bell system. Mr. Leggett is succeeded by W. E. Gathright of St. Louis, general manager of the distributing organization throughout the western states.

NEW TREE WIRE GUARD

The Spaulding Fibre company has recently announced a new tree wire guard, which is constructed of bakelite laminated, and combines high dielectric strength with resistance to abrasion. It has a flexible curtain to inclose the wire with several turns, for electrical protection. The remainder of the guard consists of a hard, tough bakelite laminated shell, weatherproof and resistant to abrasion. The shell completely incloses the fabric wrapper wire and possesses a constant gripping action that maintains tightness of the convolutions and prevents longitudinal displacement.

FAN-COOLED MOTOR

The Ideal Electric & Manufacturing company of Mansfield, Ohio, has developed a new totally-enclosed, fan-cooled motor. This is a fully protected motor with all the advantages of dust tight construction and is the same size as the ordinary open type motor of same rating.

The construction employs two shells,—the inner shell being dust tight and enclosing windings and rotor. Tight sealing is obtained by machined metal to metal stationary joints with long close fits—no running seals. A fan mounted outside this shell forces a blast of air between the inner shell and the outer one thereby providing effective cooling.

PLANS SHIP-TO-SHORE TELEPHONE SERVICE

Lorain County Radio corporation, a subsidiary of the Lorain (Ohio) Telephone company, has received notice that the Federal Radio Commission has authorized it to construct a public coastal telephone ship-to-shore service.

The proposed system will enable ships to communicate with shore at will. At present the only means of communication is by radio telegraphy which requires a wireless operator aboard ship.

Under the radio phone system, a telephone aboard ship is connected to a home station on shore by short wave transmission, and through the shore station a hook-up with any telephone anywhere is possible.

"Radio telephone service should result in savings of thousands of dollars for ship owners during a season," H. E. Hageman, treasurer and Manager of the company, said. "Changes in a ship's course, notice of strikes, or instructions as to loading can be transmitted immediately. A saving of $2,000 is effected when one day is cut from the running time of a large freighter."

Equipment also will be installed on as many ships as possible this winter in order to have them ready before the season opens next spring. Experiments will be conducted during the winter to perfect the system.

Several lines have already ordered their boats equipped. Equipment and installation for each ship will be handled by the Lorain Telephone company, and will cost about $2,000 a unit, it is estimated.

Toll charges will be little more than on land. The toll for a ship-to-shore call would be 75 cents. If it is a long distance call, the regular long distance charge would be added.

$7,000 IMPROVEMENT BY UNITED COMPANY

An extensive improvement and expansion program costing nearly $7,000, is underway with the United Telephone company of McPherson, Kan. Underground cables will replace overhead telephone wires and poles and will aid in beautifying the city. Already the work has been in progress a few weeks, says L. A. Kauffman, district manager, and in charge of the local exchange, and it is believed several more weeks will be required before the project has been completed.

The project calls for 6,000 feet of 600-pair cable, which will replace 72 poles and approximately 15 miles of telephone wire.

Twenty-four hundred feet of toll cable will be laid. Six hundred feet of a new type of conduit will be used.

About 14 men are being used on a full time basis on the project.

50 HOURS-
TO LOCATE TROUBLE

that could have been averted if Kester Cored Solder had been used originally. Write us for *free samples* and an honest story of the solder situation. Kester Solder Co., 4210 Wrightwood Ave., Chicago, Ill., Newark, N. J., or Brantford, Ont., Canada

W. L. Runzel, President, brings to this organization 41 years' experience in the manufacture of this type of telephone equipment

Telephone and Switchboard Cords and Wire

May we quote you on your requirements?

RUNZEL CORD AND WIRE CO.

4727-31 Montrose Ave., Chicago

The Home of the Perfect Cord

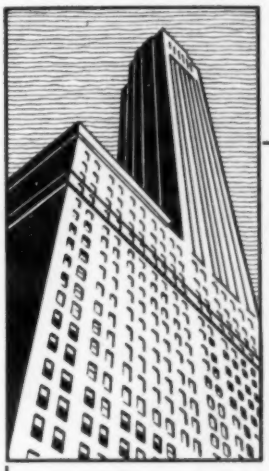
real comfort awaits you at Hotel ADELPHIA

No matter what brings you to Philadelphia—business, pleasure or a tour of America's historic landmarks—you will do well to stay at Hotel Adelphia Close to all attractions—with every comfort and luxury at low cost. Finest food deftly served in the French Restaurant, Coffee Grill and Roof Garden.

400 ROOMS *with* BATH
from $3. single from $5. double

ADELPHIA HOTEL COMPANY
David B. Provan, Managing Director

PHILADELPHIA
CHESTNUT AT 13TH STREET



Feel at Home in CHICAGO

Stay in the TOWER of HOSPITALITY

•

From the Morrison tower you look down on the "busiest corner in the world"; but high up in the quiet, homelike rooms you are far away from noise and hurry. Deep, soft beds bring sound sleep. No other Chicago hotel gives as much at such reasonable rates.

In the Heart of the Loop **Fine Garage Facilities**

• •

Only $2.50 up with Bath **Home of Terrace Garden**

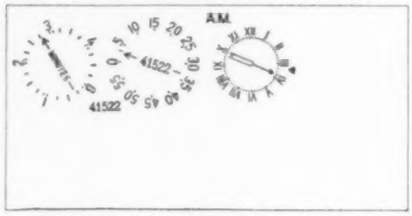
MORRISON HOTEL LEONARD HICKS *Managing Director*

CALCULAGRAPH PRINTS TIME TO SECOND

Henry Abbott, president of Calculagraph company, manufacturers of elapsed time recorders, has announced a new type of Calculagraph, perfected to the purpose of computing and printing elapsed time of toll messages in telephone exchanges down to the second. The minimum unit of time measurement was formerly 15 seconds. Telephone engineers point out that the increase of accuracy provided by this new electric-driven model of the Calculagraph will produce large gains in revenue for toll call operations.

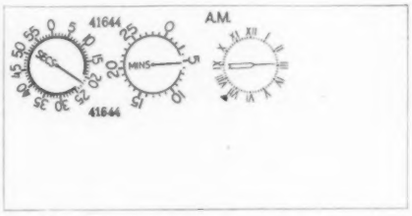
For more than 20 years, Calculagraph elapsed time records of toll messages had been considered satisfactory when indicated to within a quarter-minute or 15-second period, according to engineers and executive managers of telephone companies located in every civilized part of the world. With the increasing use of toll messages, however, particularly those showing excess time, fifteen seconds was more recently considered too great an allowance. From studies and observations it was found that revenue could be increased materially by reducing this allowance to five seconds.

For a printing machine to register time to a five-second degree required extreme accuracy in its mechanism. A new gear train was designed and the Calculagraph as modified gave excellent results. But there were increasing demands by engineers for still greater accuracy. The possibility of a four second error on long distance calls, they said, would still mean the loss of considerable revenue.



A toll ticket imprinted by Model 6 Calculagraph showing time of day, 3:19 a.m., and the elapsed time, 2¾ minutes. This model is installed on telephone switchboards throughout the world.

A synchronous motor with its great increase in power over main springs, made it possible to use a high-speed gear train. The Calculagraph company



A toll ticket imprinted by the new Model 30 Calculagraph showing time of day, 7:14 a.m. and elapsed time, five minutes 22 seconds.

has adapted and developed this means of power in the new model Calculagraph, now available, which prints elapsed time accurately to as small a period as one second.

During the past year a number of this new type of Calculagraph were tested exhaustively in several telephone exchanges with highly satisfactory results. According to Mr. Abbott's announcement, the time was read more quickly and with greater accuracy and revenue form toll calls showed a substantial increase. This type of Calculagraph is known as Model 30. It can be installed in any exchange where regulated alternating current is available. To anyone interested in this form of elapsed time record, further information may be obtained by addressing the Calculagraph company, Harrison, N. J.

NEW EXCHANGE FOR WEYAUWEGA, WIS.

A new building to house the telephone exchange, store house and garage is being erected by the Weyauwega (Wis.) Telephone company. The property was purchased by the telephone company two years ago. The building will be a modern structure, 40x64 feet in size, and will be ready for occupancy early in the spring. George Dobbins is the head of the Weyauwega Telephone company.

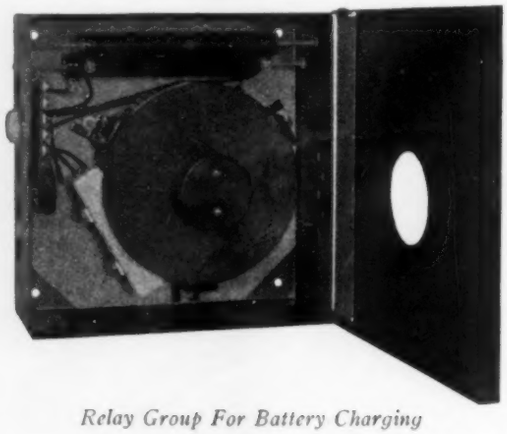
NEW CABLES LAID

New underground cables are being laid by the Massena (Ia.) Independent Telephone company.

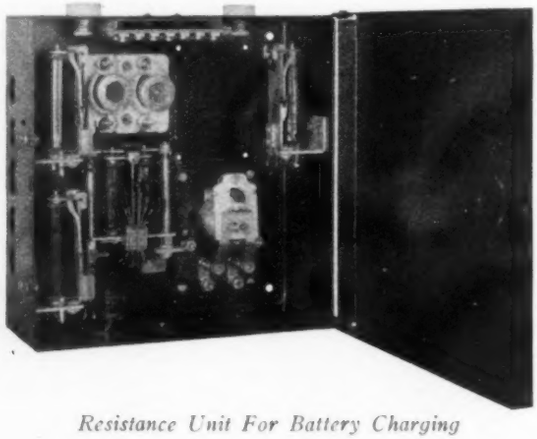
ANNOUNCES NEW D.C. BATTERY CHARGERS

Arrangement has been made by Automatic Electric company of the development of new direct-current battery charging units for 24-volt P-A-X's and P-B-X's, as well as for other 24-volt uses. The equipment is divided into two units; a relay, and a resistance group. Where 110-volt D.C. commercial current is available both of these units are used for charging the 24-volt battery which furnishes operating current to the P-A-X, or other similar equipment.

The relay unit protects against current reversals, current failure and high voltages, while the resistance unit controls the voltage and current passing through the storage battery for charging purposes. The relay unit alone can also be used in conjunction with a rectifier for "controlled rectifier" charging, or with a motor generator set, for a similar type of controlled charging. The equipment is contained in small steel cabinets designed for wall mounting.



Relay Group For Battery Charging



Resistance Unit For Battery Charging

ULTRA MODERN

250 ROOMS AND APARTMENTS FOR A DAY –A WEEK– OR A YEAR

EXCELLENT TRANSPORTATION

●

BARBER SHOP–COMMISSARY – BEAUTY SALON AND COFFEE SHOP

●

Comfort with friendly surroundings and skilled service.

RATES
SINGLE ROOM FROM $2.50
DOUBLE ROOM FROM $3.50
SUITE (Suitable for Four)
From $5.00 to $10.00

ALL BRIGHT OUTSIDE ROOMS WITH COMFORTABLE BEDS . .

●

Bedroom suites with double in-a-dor beds in the living room, and one room apartments with either twin or double in-a-dor beds.

Electric refrigeration, filtered water, forced ventilation and concealed beds.

ONE HALF BLOCK SOUTH OF DIVERSEY PARKWAY

Lincoln Park Arms

2738 PINE GROVE AVE • CHICAGO, ILL.

ESICO

Electrical Soldering Irons Assure—

QUICK HEAT LONG LIFE

ESICO tools heat quickly and maintain a constant, even temperature enabling workmen to solder steadily and efficiently. GREATER production, HIGHER quality.

Write for details on ESICO irons especially developed for telephone main frames and switchboards.

Electric Soldering Iron Co., Inc.

342 WEST 14th STREET NEW YORK, N. Y.

REBUILT and RETESTED

Telephones (complete)
Telephones (parts)
Switchboards (complete)
Switchboard (parts)
Central office protection
Relays
Repeating coils

Buckeye Telephone & Supply Company

COLUMBUS, OHIO

Electrical Measuring Instruments . . .

They are the Telephone Man's most important tools. Like all tools, they suffer from wear and tear and accidental overloads.

Very seldom can these instruments be spared for more than a few days for periodical adjustment or repairs. For more than 17 years, we have specialized in repairing and testing all types and makes of electrical instruments.

We can assure the Telephone men of a prompt and economical service on all their instruments and other testing equipment.

Try us on your next job.

Illinois Testing Laboratories, Inc.

Authorized Midwest Service Station for Many Instrument Manufacturers

147 W. AUSTIN AVE. CHICAGO, ILL.

Telephones: Superior 5264-5265

Statement of the Ownership, Management, Circulation, Etc., Required by the Act of Congress of August 24, 1912,

of Telephone Engineer, published monthly at Chicago, Illinois, for October 1, 1933.

State of Illinois, County of Cook, ss.— Before me, a notary public in and for the State and county aforesaid, personally appeared J. A. Smith, who, having been duly sworn according to law, deposes and says that he is the business manager of the Telephone Engineer, and that the following is, to the best of his knowledge and belief, a true statement of the ownership, management (and if a daily paper, the circulation), etc., of the aforesaid publication for the date shown in the above caption, required by the Act of August 24, 1912, embodied in section 411, Postal Laws and Regulations, printed on the reverse of this form, to wit:

1. That the names and addresses of the publisher, editor, managing editor, and business managers are:

Publisher—Telephone Engineer Publishing Co., Chicago, Illinois.

Editor—Ralph C. Reno, Chicago, Illinois.

Business Manager—J. A. Smith, Chicago, Illinois.

2. That the owner is: (If owned by a corporation, its name and address must be stated and also immediately thereunder the names and addresses of stockholders owning or holding one per cent or more of total amount of stock. If not owned by a corporation, the names and addresses of the individual owners must be given. If owned by a firm, company, or other unincorporated concern, its name and address as well as those of each individual member must be given.

Telephone Engineer Pub. Co., Chicago, Ill.
Mrs. Florence J. Beyer, Chicago, Ill.
F. A. Bowdle, Wheaton, Ill.
F. O. Cuppy, Lafayette, Indiana.
Mr. and Mrs. P. Kerr Higgins, University City, Mo.
C. L. Jones, Athens, Ohio.
Agnes M. Leffert, Goshen, Ind.
J. A. Smith, Chicago, Ill.
Mrs. J. A. Smith, Chicago, Ill.
Walter J. Uhl, Logansport, Ind.
Mrs. Walter J. Uhl, Logansport, Ind.
D. Weiner, Chicago, Ill.
John H. Wright, Jamestown, N. Y.

3. That the known bondholders, mortgagees, and other security holders owning or holding one per cent or more of total amount of bonds, mortgages or other securities are: (If there are none, so state.)

P. Kerr Higgins, University City, Mo.

4. That the two paragraphs next above, giving the names of the owners, stockholders, and security holders, if any, contain not only the list of stockholders and security holders as they appear upon the books of the company but also, in cases where the stockholder or security holder appears upon the books of the company as trustee or in any other fiduciary relation, the name of the person or corporation for whom such trustee is acting, is given; also that the said two paragraphs contain statements embracing affiant's full knowledge and belief as to the circumstances and conditions under which stockholders and security holders who do not appear upon the books of the company as trustees, hold stock and securities in a capacity other than that of a bona fide owner; and this affiant has no reason to believe that any other person, association, or corporation has any interest direct or indirect in the said stock, bonds, or other securities than as so stated by him.

J. A. SMITH,
Business Manager.

Sworn to and subscribed before me this 28th day of September, 1933.

(Seal) LOUIS A. BOWMAN,
Notary Public.

(My commission expires May 22, 1934.)

ADDS 38 SUBSCRIBERS

Manager Glen Carson of the Central Iowa Telephone company, is well pleased with the additions to telephone service in Eldora during the past few weeks, and has published a list of 38 new telephone users which he asks Eldora people to cut out and place in the directory.

It is reported that the North Dakota Bell Telephone company and the Dakota Central Telephone company have consolidated.

RATING TRANSMISSION PERFORMANCE

(*Continued from page* 16)

the input sounds but also the accompanying extraneous sounds which are delivered by the circuit. Also, the output sounds to be investigated cover not only those delivered by the receiver at the far end of the circuit but also those reproduced by the receiver in the station set containing the transmitter energized by the input sounds. The sounds from the near receiver include both those transmitted through the sidetone path of the set and those returned to the sending end by reflection at impedance irregularities in the circuit. Due to the time required for propagation over the circuit these latter sounds may be delayed with respect to the sidetone and hence appear as echoes. Likewise, echo sounds may be delivered at the far receiver.

Transmission characteristics do not in themselves show the service performance as realized by the users of the telephone but are essentially indications of the functioning of the circuit in reproducing sounds. They provide, therefore, a means for investigating and specifying the performance of a telephone circuit without involving many, and in some kinds of transmission characteristics any, of the actions of the talker and the listener in conversation.—*The Bell System Technical Journal.*

(To be continued)

103 COMPANIES SHOW AUGUST GAIN

Net operating income of 103 telephone companies for August, as reported to the Interstate Commerce Commission, aggregated $16,382,543, as against $14,345,959 for the like month a year ago,, an increase of $2,036,584. Gross was $79,356,279, compared with $82,805,430, off $3,449,151.

For the first eight months of the year, net operating income of these companies amounted to $120,811,167, against $129,612,210 for the corresponding 1932 period; while gross totaled $633,038,528, as against $705,476,352.

BOLSTERING UP SERVICE

(*Continued from page* 12)

Because from his dollar must come our profits, all our wages, and everything that makes the telephone business worthwhile.

The success of many companies is actual proof that you can get just about anything you need from the public you serve, if you have been giving them everything to which they are entitled and giving it to them in the proper way.

Where-to-Buy Section

For the convenience of readers of Telephone Engineer

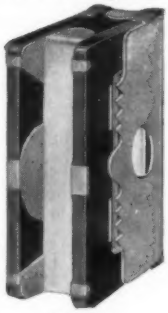
Accounting Systems

COFFEY SYSTEM & AUDIT CO.
Exclusive telephone accounting since 1907.
Certified Public Accountants.
We install the well-known
COFFEY SYSTEM
Audits—Rate Cases and Special Work.
A Central Accounting Department.
454 Consolidated Bldg., Indianapolis, Ind.

ACCOUNTING
HERDRICH AND BOGGS
Certified Public Accountants
Specializing in Telephone Accounting
and Rate Cases Since 1918.
901-7 Continental Bank Bldg.
Indianapolis, Indiana

Lightning Arresters

Neon Lightning Arrester Units



Full Size

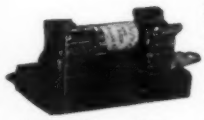
Interchangeable with carbon mica or carbon porcelain.

Better Protection
Non Grounding
Clearer Lines

L. S. BRACH MFG. CORP.
Newark, N. J.
Dept.-T.

Send for Catalog 33-B

Test Sets



1774 Wilson Ave.,
Chicago, Ill.

LOW RANGE FUSES
INSTRUMENT LITTELFUSES 1/100, 1/32, 1/16, ⅛, ¼, ⅜, ½, ¾, 1 and 2 amps., positively protect meters, radios, amplifiers, etc. $100 Protection Guaranty. *Write today for instructive bulletin.*
Littelfuse Laboratories

We Help You

Take space on this page and we help you find prospects and make sales. We're both benefitted.

INCREASE EMPLOYMENT AT STROMBERG

Because of a steady and gradual increase in the company's business during the past six months, the Stromberg-Carlson Telephone Manufacturing company reports a factory employment increase of approximately one hundred per cent during that period. A statement from Wesley M. Angle, vice president and secretary of the company reveals orders on hand sufficient to keep the present force working at capacity until the first of the year. Mr. Angle's statement is as follows:

"It is with a great deal of satisfaction that the Stromberg-Carlson company has been able to double its factory employment during the last few months —satisfaction not alone because increase in sales have made this possible, but also because of the additional purchasing power which is bound to give added impetus to a return to normal life in our community.

"Almost every day of the past two months has seen additions to our factory force. The Stromberg-Carlson company takes a great deal of pride in the fact that orders are coming in at a rate which seems to insure the steady employment of these workers for many weeks to come."

PLACES BIG ORDER

The Societa Italiana Reti Telefoniche Interurbane, an Italian company furnishing long distance telephone cable systems, has just received an order from the Italian Government for further extension of the Italian underground cable network. This company has placed orders for equipment on factories associated with the International Telephone and Telegraph Corporation to an amount exceeding $800,000.

The train of time and opportunity has no rear entrance; you have to enter by the front door if you care to ride.

If you are wise and prudent you are to be congratulated, but, if you are unable to forget how wise and prudent you are, then you are to be pitied.

Poles

Finished Cedar Poles
VALENTINE CLARK CORPORATION
St. Paul, Minn.

Telephone Directories

Telephone Directory ADVERTISING
Write or telephone for proposition
L.M.BERRY & CO.
Call L.D.16—Telephone Bldg., Dayton, O.

Make Your Directory a Source of Income
Write for Particulars
J. H. WELKER
McKINLEY BLOCK, CANTON, O.
Telephone 8009
DIRECTORY ADVERTISING EXCLUSIVELY

Telephone Engineers

J. G. WRAY & CO.
Telephone Engineers
Specialists in Appraisals, Rate Surveys, Financial Investigations, Organization and Operation of Telephone Companies
Rm. 2626 Bankers Bldg., Chicago

CONSULTING TELEPHONE ENGINEERS
Rates Financing Accounting Managing
Appraisals and Reports
Radio Program Service Specialists
Construction Contractors
TELEPHONE ENGINEERING AND MANAGEMENT COMPANY
Lima, Ohio

TELEPHONE EXCHANGE SERVICE
Have you an exchange for sale or do you wish to buy one? We are in touch with both buyer and seller. Send us your data. Perhaps we can get together.
Telephone Service Association
1218-63 E. Lake St. Chicago, Illinois

INDEX TO ADVERTISERS

A

Adelphia Hotel 33
American Tel. & Tel. Co. 4-5
American-Automatic Elec. Sales Co. 20-21
American and Annex Hotels ..... —

B

Bashlin, W. M., Inc. ..... —
Bernz Co., Otto ..... —
Berry, L. M. 37
Bowdle Accounting Systems ..... —
Brach, L. S., Mfg. Co. 37
Buckeye Telephone Supply Co. 36

C

Calculagraph Co. 27
Chemical Warfare Products Co. ..... —
Coffey System & Audit Co. 37
Coffing Hoist Co. 1
Cook Electric Co. 25
Cope, T. J., Inc. ..... —
Curtin-Howe Corp. ..... —

D

Dillon Mfg. Co. 1
Durland, H. S. ..... —

E

Electric Soldering Iron Co. 36

F

Forged Steel Products Co. 25

G

Gould, George V. ..... —
Graybar Electric Co. 27

H

Herdrich & Boggs 37

I

Illinois Testing Laboratories 36
Indiana Steel & Wire Co. 25
Inland Equipment Co. ..... —

K

Kearney Corp., Jas. R. ..... —
Kellogg Switchboard & Supply Co. 2
Kester Solder Co. 33

L

Leich Electric Co. 8
Lenz Electric Mfg. Co. 31
Lincoln Park Arms 35
Littelfuse Laboratories 37
Lorraine Hotel ..... —

M

MacGillis & Gibbs ..... —
Minnesota Electric Co. ..... —
Morrison Hotel 33

N

National Carbon Co. 7
National Lbr. & Creo. Co. ..... —
North Electric Co. 40

O

Owens-Illinois ..... —

P

Premier Electric Co. ..... —

R

Rebuilt Electric Equip. Co. ..... —
Reliable Electric Co. 8
Runzel Cord & Wire Co. 33

S

Sands Electric Co. 1
Stromberg-Carlson Tel. Mfg. Co. 6-39
Suttle Equipment Co. ..... —

T

Telephone Eng. & Management Company 37
Teletype Corp. ..... —
Telkor, Inc. ..... —

U

Unique Mfg. Co. ..... —
Universal Specialty Co. ..... —

V

Valentine & Clark Corp. 37

W

Webster Company, The ..... —
Welker, J. H. 37
Western Electric Co. 29
Whitney Blake Co. 1
Wray, J. G., & Co. 37